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Editorial

With the final issue of Volume XVII the JOURNAL greets as readers the medical students and interns of Canada. We feel it a great privilege to publish the first report of the Canadian Association of Medical Students and Interns, and it is our hope that in the near future the C.A.M.S.I. will see fit to promote the national circulation of one of the other Canadian undergraduate medical publications.

The statement has frequently been made in previous editorials that this JOURNAL was the first undergraduate medical publication on the North American continent. As no exception has been taken to this claim, one may accept it as fact. Such a publication has a very definite value in that it provides an opportunity for approximately 50 undergraduates each year to prepare for publication their first scientific article, and secondly it introduces the student to the reading of current periodicals as a source of knowledge in addition to his text books and lecture notes.

Perhaps one should apologize for, or rather justify the publication of articles on subjects upon which already too much has been written, but the well-known adage, "common things are commonest" is true and these are naturally the conditions in which the student is most interested.

On behalf of the editorial staff, the editor wishes to express sincere thanks to the members of the teaching staff and undergraduate body who have contributed to the pages of Volume XVII, to Mr. A. J. Denne who has worked diligently on this C.A.M.S.I. number, and to Mr. Weir of the University Press for his interest and co-operation.

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PRESENTE SES HOMMAGES

A

L' A. C. E. M. I.

CAUSE AND EFFECT

By WILLIAM BOYD, M.D., F.R.C.P. Lond.
Professor of Pathology, University of Toronto

The student of medicine is concerned with the study of symptoms and lesions. These are effects, so he must further concern himself with the causes of these effects. But how to prove that a supposed cause is responsible for an effect—ah, there's the rub! Causality, or the theory of the relation between cause and effect, is one of the most intricate and important questions of philosophical doctrine. But the nature and ground of the relation between cause and effect are obscure and disputed. To the Greeks the concept of cause was different from what it is today. Its connotation was the nature and essence of things, whereas now it signifies the connection *between* things rather than their essence. In modern science cause may be said to mean the explanation of change, a concept which is well exemplified in the field of disease. John Stuart Mill points out that scientifically the cause of anything is the total assemblage of the conditions which precede its appearance. But among the conditions of an event there are always one or two that stand in specially close relation to it; thus alcohol is more closely related to a man's drunken gait than is the attraction of the earth's gravity, although the latter plays a necessary part.

All reasoning about matters of fact, all physical science, depends on the relation of cause and effect. Yet between the cause and the effect there is no discoverable connection. In the words of David Hume, the 18th century philosopher, "There appears not, through all nature, any one connection which is conceivable by us. All events seem entirely loose and separate. One event follows another, but we can never observe any tie between them. They seem conjoined, but never connected". According to Hume the concept of cause depends on the operation of custom. When one object, A, has been noticed frequently to precede another object, B, an association between A and B is generated, and by virtue of this association we say that A is the cause of B. The weakness of this reasoning lies in the fact that many invariable successions, such as night and day, do not make us regard one as causing the other.

That a thing has always happened in the past is no guarantee that it will necessarily happen in the future. It is true that a certain regularity prevails, and this observation has led to immensely useful and practical results. But in the last few years the existence of this very regularity has been questioned. Twenty years ago practically every physicist believed in determinism, that every detailed occurrence can be correlated with its antecedents in a perfectly definite manner exemplifying general principles. Then this belief suddenly faded. It would now appear that at least in the realm of ultramicroscopic physics, the physics of the atom, we must abandon the principle of causal connection. Analysis by modern methods reveals that the behaviour of a single molecule is absolutely haphazard. It is impossible to determine the location and velocity of a particle, i.e., an electron, at the same instant, so that we cannot predict with certainty a subsequent state of that particle. Certainty has been replaced by probability. It is obvious how revolutionary a departure this is from the classical mechanical concept of cause and effect. The elevation of chance to the throne, so long occupied by determinism, may seem to bring us back to the age of miracles, an idea which should appeal to the physician whose patient, given up as hopeless, may recover in spite of the doctor.

Fortunately, orderliness can spring from chance owing to the infinite number of units involved, and in mass phenomena it is statistical laws which operate. This is the basis of life insurance. The insur-

ance company cannot foretell the fate of a given individual, but by observing statistical laws it can fix the proper premium for that individual.

To attempt to define causation in relation to disease is an intellectual exercise as exasperating as any you can find. The Concise Oxford Dictionary, that masterpiece of exact description, defines a cause as "an antecedent invariably and unconditionally followed by a certain phenomenon". What, then, is the cause of diphtheria? Surely not the diphtheria bacillus, for the presence of that organism in the throat is certainly not invariably and unconditionally followed by development of the disease. An aetiological factor in disease does not need to be constant. Malnutrition is an inconstant factor in the aetiology of tuberculosis, but it may be an essential factor. It may of course be a result of tuberculosis. Finally it may be neither, merely an associated condition. From these simple examples it becomes evident how complex and difficult is the subject of the causation of disease. We must admit, however unwillingly, that we seldom or never really know the cause of anything. We merely note a constant association. The apple falls, and we say that it is caused by the action of gravity. But that is no adequate explanation, for we have not the remotest idea of how gravity acts on the apple. We say that the tubercle bacillus is the cause of tuberculosis. That is merely a way of saying that the bacillus is constantly associated with a certain type of lesion; it is no explanation of how the lesions are produced by the bacillus.

Causal agents of disease may be classified as exogenous and endogenous. The first external agent to be recognized was trauma. This recognition was easy, because effect followed cause at once or after a short interval. The onset of traumatic disease, however, may be insidious, and its origin correspondingly obscure and mysterious, not to be recognized by simple observation. The trained observer, and later the experimentalist were needed gradually to reveal the underlying and hidden connection between cause and effect. An excellent example in the field of traumatic disease is afforded by subdural haemorrhage. A person sustains a comparatively trivial injury to the head, and weeks, possibly months later, when all recollection of the injury may have been lost, a train of mysterious cerebral symptoms develop which terminate in death. Only the observations of the pathologist in the post-mortem room combined with the analysis of many such cases by the neurologist lead to the final conception that the large haematoma found under the dura is to be traced to the long-antecedent injury. Gay points out that pathology has progressed from behind forwards, or rather in the Chinese fashion of reading from right to left. First the symptoms of a disease were recognized and described, then the lesion responsible for the symptoms, then the disturbed function that precedes and produces the lesion (pathogenesis), and finally the causative agent which started the process. Thus general paresis was first recognized as characterized by delusions of grandeur, etc.; then atrophy of the frontal convolutions was noted; finally the Treponema pallidum was discovered in these atrophic convolutions. The conception was first that of a mental disease, then a disease of the nervous system, and finally an infectious disease.

When we ask for the proof that a bacterium is the cause of a given disease we find ourselves in need of every critical faculty that we possess. The first step is the demonstration of the bacterium in the affected tissues, coupled with its absence from healthy tissues. This was the method employed by Koch in his investigation of the cause of tuberculosis. He succeeded in staining the tubercle bacillus in situ. But if we try to prove the syphilitic nature of a gumma by demonstrating the spirochaete in the tissues we shall almost certainly fail. More subtle methods for solving the problem are required. As a matter of fact it is doubtful if absolute proof such as would satisfy a physicist is possible. All that can be said is that a gumma is frequently preceded by the secondary and primary lesions of a disease in which the accepted bacterial cause of syphilis can usually be demon-

strated. Moreover the mere presence of bacteria in the body does not of itself constitute proof that they are of aetiological significance. Pathogenic organisms lead a harmless saprophytic existence in carriers, whilst organisms found in the tissues may be secondary invaders which bear no causal relationship to the lesions in which they occur. Reproduction of the disease by animal inoculation and the demonstration of specific immune bodies in the patient's serum are diagnostic methods of great value, but here also there are many pitfalls for the unwary, and it is hard to say when they constitute scientific proof.

If it is sometimes difficult to prove conclusively the causal relationship of a bacterium to a disease, this difficulty becomes very much greater in the case of virus diseases. In addition to a virus being ultramicroscopic in size, so that it cannot be seen, it refuses to grow on bacteriological media. It can therefore only be recognized by the effect it produces. This effect may be clinical or histological. Sometimes the clinical effect is unequivocal, as in the paralysis which follows inoculation with poliomyelitis virus, sometimes it is of the type in which certainty is extremely difficult, as in the case of influenza. Similarly the histological change produced by a virus may be characteristic or indeterminate. Necrosis of a specific cell type may be pathognomonic, as exemplified by the destruction of the anterior horn cells produced by the virus of poliomyelitis. The peculiar features known as cell inclusions have been regarded as the tell-tale finger prints left by a virus, and with such inclusions as the Negri bodies in rabies this is undoubtedly true. It is now recognized, however, that identical appearances may be produced by non-viral agencies. Thus the intranuclear inclusions in the liver in cases of yellow fever may be mimicked perfectly in severe and extensive burns. Proof of causality in the case of a virus may therefore be a matter of great difficulty.

Within recent years it has come to be recognized that two infective elements may be needed to produce the clinical picture we know as disease, although either of these of itself may be innocuous —surely a discovery of far-reaching significance. The best example of two-fold bacterial causation is afforded by Shope's work on swine influenza. This epidemic disease is caused by the combined action of a completely harmless bacterium, Haemophilus influenzae suis, and a filterable virus which of itself is only able to produce an exceedingly mild infection. When these two relatively innocent agents act in unison they produce a serious disease with very severe lesions. Such a well authenticated instance of the combined action of two infective agents compels one to consider in how many other diseases the same may be true.

The development of the conception that disease is for the most part caused by external agents laid emphasis on the idea that the causal agent was of a positive character. The suggestion that disease might be due to a deficiency of some element necessary for the welfare of the body opened up an entirely new line of thought. Work was at first confined to the field of the vitamins, and it was learned that one vitamin is necessary for the health of the central nervous system, another for the epithelium of mucous membranes, a third for intercellular substance, and so on. In time the idea of deficiency diseases has widened, and it is now realized how potent as a causal agent of disease may be deficiency in some mineral constituent of the body, so much so that the modern classification of the anaemias is on a deficiency basis. The ductless glands are specially related to mineral metabolism, e.g., the thyroid to iodine, the parathyroids to calcium, the adrenals to sodium and chlorine, and so on. How minute may be the amount needed for the health of the body is illustrated by the case of iodine, the necessary intake of which is only 10 to 20 mgms. a year; yet the fact that endemic (colloid) goitre is a deficiency disease due to lack of iodine is universally accepted.

It seems probable that in the future more and more stress will be laid on the duality or multiplicity of factors in the causation of disease. Bacterial and virus

infection, vitamin deficiency, and mineral deficiency may be combined in various ways at which we are only now beginning to guess. To break one link in the chain of causal factors may mean therapeutic success, but it does not mean that there are not other links in the chain. Thus splenectomy may cure the clinical picture of haemolytic jaundice, relieving the patient of all his symptoms, but the essential underlying defect still remains, namely undue fragility of the red blood cells. Similarly, removal of the thyroid may work wonders in a patient with Graves' disease, but that does not justify the conclusion that dysfunction of the thyroid is the basic factor in the production of the disease.

The possibility of multiple factors is of special interest and importance in the disease which first directed my attention to the subject of causality, namely cancer. Many causes of cancer are already known, so many, indeed, that the result has been confusion. Cancer in the animal is identical with cancer in man, and experimental cancer can be produced by the application of tar and a host of synthetic products most but not all of which are characterized by the possession of a phenanthrene ring, by the injection of an ovarian hormone, by Rous' filterable virus, by exposure to x-rays and radium, and by yet other methods. Even such an apparently inert substance as zinc chloride is capable of inducing malignant disease of the testis. How then can we speak or even think of *the* cause of cancer? A filterable agent is the cause of the Rous sarcoma, continued administration of ovarian hormone may cause carcinoma of the breast, prolonged mechanical irritation of squamous stratified epithelium may result in the development of epidermoid carcinoma. It is evident that exogenous agents of widely varied character may initiate the self-propagating process of cellular proliferation we know as cancer.

So far our consideration of causation has been concerned with exogenous agents of disease. But the mention of a constitutional tendency to cancer brings up the idea of endogenous factors. At first sight it would appear that many diseases are essentially endogenous in origin. Such examples as inherited defects like colour blindness, polydactylism, and haemophilia suggest themselves, as well as many nervous and mental diseases. But it is only a narrow view of disease which ascribes to it endogenous origins. From a wider viewpoint, environment contains most if not all the initiating factors of disease. At first sight, hormone deficiency or excess may seem to be fundamentally endogenous in character, and yet there is no reason to predicate an autonomy for the endocrine glands which is denied to other organs. Pituitary dysfunction may appear to arise from within; yet when we turn to the thyroid the importance of an exogenous element, iodine, at once becomes apparent. Human environment is much more complex than food factors and bacterial and protozoal enemies, although it is much easier to investigate these than the effects, say, of climate or psychic influences. An exogenous influence may be the starting point of changes which may eventually seem to be essentially endogenous. Thus an exogenous factor, namely x-rays or radium, may produce in Drosophila, the fruit-fly, gene mutations on which hereditary malformations are dependent. Once this change is established, malformations are transmitted which would be considered endogenous in character were not their true origin known. It is therefore possible that organic degenerations, blood diseases, and other conditions which appear to be intimately bound up with the constitution of the patient may at one time have been of exogenous origin.

When we review the various considerations which have been discussed in this paper, it becomes apparent that causation in relation to disease is a more complex matter than one might at first suppose, that the possibility of a pleurality of causal agents must be borne in mind, and that we do not know as much as we are apt to imagine regarding the relationship between cause and effect.

GAITS

A NEUROLOGIST'S VIEWPOINT

By S. E. C. TURVEY, M.D., M.R.C.P. Lond., F.R.C.P.(C.)
Vancouver General Hospital

From a neurologist's point of view, a study of 'gait' should not be limited to observation of the physical phenomena pertaining to the lower back and legs, but should properly include an assessment of the attitude and movements of the entire person during locomotion. A diagnosis should rarely or probably never be made by observation of the gait alone. Often times, however, it will give invaluable clues to the nature of the ailment and in many cases it may afford the only clue to a diagnosis. The neurologists of the English School at Queens' Square brought this intricate art of observation to a masterly level. No more fascinating demonstration of skill in medicine could be imagined than to watch Gordon Holmes, Risien Russell, James Collier, Kinnier Wilson, or W. J. Adie, record their detailed observations that had seemingly been made in a few seconds. These physicians always emphasized that, as the patient walked into an office or consulting room, one should observe the following regions:

1. *Facies*: Width of the palpebral fissures, equality and size of the pupils, the axes of the eyes, the facial symmetry and lines, the involuntary movements and tremors, and lastly the emotional expressions of pain, discontent or euphoria.
2. *General Bodily Attitude*: Whether it be of flexion, or of scoliosis, or other deviations from the normal.
3. *Neck*: Position in which the head is held, the presence of tremors, the lines of the sterno-mastoid muscles.
4. *Arms*: Their position in relation to the trunk, whether they are swung or not, the presence of tremors.
5. *Legs*: The attitude, whether of flexion, extension or rotation; the length of the stride; the presence of tremors or involuntary movements, whether they are spastic or flaccid.

The patient is first observed as he walks towards you and later should be observed "in puris naturalibus", or while only wearing a loin cloth. At first it may be necessary to have the patient walk back and forth several times but with training it is amazing how rapidly the powers of observation can improve for even minute details.

Parkinsonism

The appearance is typical in advanced cases but in the early or unilateral case, careful observation is necessary. There is rigidity which makes the face immobile (frequent winking, absence of the usual play of emotional movements); causes the neck to be held stiffly forwards, as if the head and neck were one piece with the trunk; gives the trunk a stooping attitude with rounded shoulders; prevents the arms from being swung when walking, and often causes them to be carried with the elbows semiflexed and held against the sides; makes the gait devoid of spring and elasticity, consisting of short steps, feet raised but little from the floor, with a tendency to stumble easily. Propulsion, retropulsion and latero-pulsion and festination may be present. And lastly, the slow, rhythmic, coarse tremor of the hands and forearms is unmistakeable. The unilateral cases may superficially resemble hemiparesis.

Hemiplegia

The face may show little asymmetry except during voluntary movements, but the lines of the face may be lessened on the affected side. The neck and trunk are not affected. The arm is not swung in walking and is adducted and internally

rotated; the elbow is flexed and pronated; the wrist and fingers are flexed. The leg is held in extension with the foot in the equinovarus position. As the toes thus tend to catch on the ground, the leg is circumducted at the hip during its advancement while the pelvis is slightly tilted towards the opposite side.

Spastic Diplegia

The thighs are rotated inwards, the knees closely pressed together, the knees slightly flexed or extended, and the feet maintained in the equinus or the varus position. The gait is stiff and clumsy, and in severe cases, is typically cross-legged or scissors-like. Each leg seems to be jerked forward in a circular swing, in very short steps.

Tabes

Ptosis is frequent and small, fixed pupils even more so. The patient is commonly pallid and thin. The neck, trunk and arms are not remarkable. He walks on a wide base with his eyes on the ground, raises his feet too high and throws them too far forward, slapping them down forcibly with the entire sole striking the ground at once. Later he reels like a drunkard.

Subacute Combined Degeneration

The gait is in no wise different from that seen in the tabetic except that the legs are spastic and not flaccid.

Dementia Paralytica

Facial tremors are common and there is a peculiar immobility of the face, often called "flattening". The pupils are frequently small and do not react to light. Fine tremors of the finger may be noticed. They have a listless, tired gait with no springiness. They may appear depressed or disinterested, or may walk in jauntily and, as Doctor Adie used to say, with a derby hat on their head even though a class of students be present.

Marche à Petis Pas

This is a mild form of diplegic gait which occurs in old people who have bilateral cerebral arteriosclerosis. The stride is abnormally shortened, the legs are stiffened, but there is no actual scissor-gait.

Spastic Paraplegia

The patient walks stiffly, in shortened strides with the toes clinging to the ground. The toes of his shoes are worn. As the toe catches on the ground, ankle clonus may occur, causing sudden repeated jerks of the entire limb. He turns slowly, stumbles easily and jerks each leg forward. Scissor-gait does not occur. One has seen Kinnier Wilson refute a diagnosis of Friedreich's ataxia by watching the man turn around in walking—the toe caught, producing an ankle clonus.

Pseudo-hypertrophic Muscular Dystrophy

The child begins to walk late, falls easily and arises with difficulty. He walks with the legs far apart and the upper part of the trunk is thrown back so that the most prominent vertebra is in a position posterior to the sacrum. His attitude is compensatory for the forward tilting of the pelvis due to the gluteal muscles. To clear the ground with the advancing foot the body is inclined to one side and then the other so that a "waddling" gait results. This has also been called "aldermanic" gait and may be confused with the gait observed in:

(1) Congenital dislocation of the hips.
(2) Spondylolisthesis.
(3) Amyoplasia congenital.

Cerebellar Disease

In unilateral cerebellar disease, the posture of the head is altered so that the occiput is tilted toward the shoulder of the side opposite to the lesion, and the face is turned slightly to the side of the lesion. The shoulder on the side of the lesion tends to sag below the level of the other shoulder. In walking there is a tendency to sway and deviate to the side

of the lesion. Other manifestations of dysmetria may be present such as a tendency to walk on a wide base, to raise the legs unduly and to stamp them down heavily. If in bilateral lesions, the gait is reeling or staggering with an occasional sudden lurch to one or the other side.

Hysteria

The gait in hysteria may imitate almost any disease, but very rarely is it a faithful imitation. Paralysis affects generally the left side of the body and is common in the legs. Usually the movements are greatly exaggerated, there is often an effort out of proportion for the required movement, and the patient's face will show an emotional content and effort or pain which is also out of proportion to the effort. Frequently the gaits are fantastic, elaborate, exhausting and bizarre. The limb or limbs may be paralysed, flaccid or spastic.

AN ORTHOPAEDIST'S VIEWPOINT

By H. H. BOUCHER, M.D., C.M., M.S.
Vancouver General Hospital

Gait is acquired instinctively. Equilibrium is unstable at first, falls are frequent, and not until after two years is stability attained and the gait characterized by gentle undulation. Walking, as in the normal gait, is dependent upon co-ordination of muscles throughout the body. Free joint motion is imperative, and a healthy central nervous system ensures stability through muscular control and joint-sense. Well formed feet, good postural tone, and clear vision are other necessary factors in normal gait.

Exaggeration of normal phases causes peculiarity of gait. The sailor raises the pelvis high on the standing side and drops it low on the swinging side. The return swing is restrained in funeral gait to increase the duration of the step. Loss of postural tone and inco-ordination of muscle from enforced bed rest necessitate a wider supporting base line, so the legs are spread widely apart. The child learns to walk in this fashion. Habitual malposture is characterized by increased lumbar lordosis and dorsal kyphosis with the head held forward and down. The abdomen is relaxed and there is a lack of tone in the gait with slight flexion at the knees. The gait of fatigue resembles that of malposture, and has been described as the most honorable physiological variation.

The Pathological Gait

The cause of this may be due to altered statics, dynamics, or a combination of both. An example of altered statics is the shortened limb which causes a greater rise and fall of the centre of gravity in the saggital plane. If due only to shortening of bone, as in malunion with healthy musculature, or to flexion contracture, there will be a minimum of increase in fatigue. Should the shortening, however, be the result of infantile paralysis, there will be associated, the major factor of weakened or paralysed musculature and the onset of fatigue will be early. Other examples of altered statics are: bowing due to disease or injury, coxa vara, static flat foot, and ankylosis or stiffness of joints.

Instability produces altered dynamics. This occurs in poliomyelitis, congenital dislocation of the hip, non-union of fracture of the femoral neck, etc. Frequently, instability is accompanied by altered statics, e.g., paralysis of the hip abductors in anterior poliomyelitis with a short lower extremity. In congenital dislocation of the hip, the head of the femur lacks the support given by the acetabulum and moves upwards and backwards on the ilium. The stabilizing influence of the gluteus medius is gone and there is short-

ening. The head and shoulders bend far toward the affected side and if both hips are involved, the gait becomes a waddle. This occurs to a lesser degree in coxa vara where there is also shortening of the lever arm with insufficiency of the glutei.

Ankylotic Gait: Stiffness in the hip joint necessitates increased motion of the pelvis in both elevation and transverse rotation. Should one or both hips be ankylosed, pelvic rotation entirely replaces swing and the gait becomes a shuffle. This is laborious and the patient tires easily.

Paralytic Gait

Gluteus Maximus: The support given to the pelvis by this muscle to keep the body erect is lost. The trunk muscles contract strongly to prevent forward flexion at the hip and a backward thrust occurs carrying the centre of gravity posteriorly. This is obviously an exceedingly tiring type of gait.

Gluteus Medius: In the normal individual when walking or standing on one leg, the gluteus medius of that side contracts strongly and raises the opposite side of the pelvis. If this muscle is paralysed the lever arm is lost, the pelvis drops to the opposite side and the gait is a waddle.

Quadriceps: This allows jack-knifing at the knee. If the gluteus maximus and triceps surae are active, a fairly normal gait is possible. With the trunk slightly flexed, making use of gravity, the gluteus maximus acting from above prevents flexion of the hip and produces extension of the knee with the aid of the soleus acting upon the tibia from a fixed point below. If the triceps surae is also paralysed, the trunk must be further flexed and gravity and the gluteus maximus alone stabilize the knee. As flexion of the knee is dangerous, the step is shorter and a limp occurs. With paralysis of the gluteus maximus the trunk can no longer be flexed as there is no hip extensor to balance it, so a lurching gait follows with the body bent backwards and the knee held straight. An attempt to gain added stability is made by an outward rotation at the knee, thus locking it. Occasionally in quadriceps paralysis the hand of the same side is pressed firmly against the anterior aspect of the mid-thigh accompanied by flexion of the trunk. An adult had regained fair power in his quadriceps but through long habit and distrust continued to walk in this fashion.

Paralysis of the extensors of the foot produces a foot-drop and the leg is lifted high, resembling the gait of early ataxia. When the gastrocnemius is paralysed a take-off is impossible and heel walking occurs with marked limp.

Numerous **foot conditions** will cause an alteration in gait. A few are: painful callus, metatarsalgia, extreme degrees of pes plannus or pes cavus, the talipes, hallux rigidus, hammertoe, inflamed bursae, etc.

Certain **low back conditions** as sciatic scoliosis, accompanied by leg pain whether referred or due to peripheral neuritis, will cause a limp.

The gait with prostheses: If the amputation of the leg below the knee has left a stump of sufficient length to serve as a lever arm, the gait approaches the normal. Pronation and supination which occur in the subastragaloid joint are lacking in the usual prosthesis and walking on uneven ground is difficult. In amputation above the knee, the patient walks with the trunk slightly forward so that the line of gravity will fall in front of the knee, as stability at this joint is provided only by elastic straps.

An error to avoid in the study of pathological gait is that of making 'snap-diagnoses'. Careful observation should be followed by clinical examination with the patient stripped except for a loin cloth or a single snug-fitting garment.

A PROBLEM IN DIAGNOSIS

By J. R. F. MILLS, M.D., M.S.

The patient, a 69 year old white, Canadian female was admitted to hospital with the complaint of jaundice of three weeks duration.

One year and nine months previously she began to have attacks of severe epigastric pain radiating through to her back and shortly followed by jaundice. The jaundice persisted for four months at which time a gall bladder containing stones was removed. The common duct was explored and a T-tube left in for three weeks.

She had been perfectly well following this illness until one month prior to admission when she noticed that her urine was darker than normal. Shortly after this she began to have a feeling of distension with nausea and belching of gas following ingestion of small amounts of food.

One week later she noticed an icteric tint to her skin, and this has gradually progressed to quite deep jaundice. She has had marked pruritis associated with it.

There was no history of chills or fever, nor of any abdominal pain. There had been some loss of weight but the patient could not state the amount.

Functional Enquiry, Past Illnesses, Personal History and Family History revealed nothing of note.

Physical Examination

The patient was moderately well-nourished and was in no acute distress. The skin was deeply jaundiced and her sclerae were distinctly icteric.

Head and Neck: Not remarkable.

Chest: Occasional râles at each base.

Cardiovascular System: Heart was not enlarged. B.P. 156/70.

Abdomen: The abdomen was rather obese but quite soft and not tender. The scar of a previous operation was present in the right upper quadrant. The liver was slightly enlarged but not tender. There was a rounded, slightly nodular mass on its inferior margin which resembled a gall bladder in size and position but the gall bladder had been removed previously. The spleen was not palpable.

Rectal and Vaginal Examinations: Negative.

Extremities: There was considerable bruising of skin and discoloration in both anticubital fossae where venapunctures had been done.

Laboratory Examination

Urinalysis. Bile ++; Urobilin ++.
Haemoglobin—81%; W.B.C.—8,000.
Van den Bergh—30 units.
Galactose Tolerance Test—2.5 grams.
Prothrombin time—20 seconds.
Phosphatase—38 units.
Stools were clay coloured. Bile and urobilin negative.
Wassermann—negative.

Course in Hospital

The patient's prothrombin time increased to 45 seconds but after the administration of adequate amounts of synthetic vitamin K, it fell to 15 seconds. Van den Bergh increased to 50 units.

Turn to page 279 for diagnosis and discussion.

POST-OPERATIVE THYROID CRISIS

By Wm. K. KERR, '40

Thyroid crisis or thyroid storm is an intense exacerbation of all the symptoms of hyperthyroidism, so intense that this complication of thyroidectomy was almost solely responsible for the high mortality which in former years attended any operation on the thyroid gland. It is by the prevention of thyroid crisis that present day surgery of the thyroid gland has become a relatively safe procedure with a mortality as low as 1 per cent.

Thyroid crisis is however still responsible for almost two thirds of the present day mortality in thyroidectomy and while formerly one could expect thyroid crisis with any hyperthyroid patient, it is now necessary to study the patients carefully before operation in order to anticipate this complication which may still occur in spite of adequate pre-operative preparation.

Predisposing Factors and Premonitory Signs

From the study of a large number of cases it has now become possible to recognize the hyperthyroid patient who is prone to develop thyroid crisis.

A. When the patient is first seen.

It is important to estimate the severity of the patient's condition before pre-operative preparation with iodine and to keep this in mind because later on the remarkable but transitory amelioration of symptoms may give a false impression of of the case.

1. Weight Loss. Probably the most valuable index of a poor operative risk is the loss of considerable weight provided that there has been no abnormal diminution in food intake. A weight loss of 30 pounds or more is a very grave sign.

2. Duration. The length of time the patient has had the disease is more important than the apparent severity of the signs and symptoms at the time.

3. Age. The older the patient, the poorer the operative risk. This applies to operations on the thyroid far more than to surgery in general, largely because of the added dangers of pneumonia and heart failure but also because the older patient is less likely to survive the ordeal of a thyroid crisis than the younger one.

4. Type of Hyperthyroidism. The fatality of toxic adenoma is three times that of exophthalmic goiter. The high-strung, nervous, apprehensive and uncooperative patient is particularly prone to develop thyroid crisis.

5. B.M.R. The basal metabolic rate may be high or low and taken by itself affords a deceptive index of the operative risk. While a high rate usually accompanies severe hyperthyroidism, a low rate does not necessarily mean a milder degree of toxicity and is certainly not an indication of the patient's ability to withstand the intoxication or the operation.

6. Pulse and Blood Pressure. A high and irregular pulse rate and blood pressure is indicative of severe hyperthyroidism, an increase in pulse pressure being almost more significant than the absolute height of the blood pressure.

7. Other Diseases. The presence of certain other diseases not only predisposes the patient to thyroid crisis but renders him less likely to survive it. Among these, heart disease is the most prominent and dangerous. Acute infections, diabetes and pregnancy are also very dangerous.

One can well summarize the above factors by stating that the apparently mild case of hyperthyroidism, the toxic adenoma with a comparatively low B.M.R. but past middle age and of fairly long duration is more dangerous than the young apparently fulminating exophthalmic type with a high B.M.R.

B. After pre-operative preparation.

The improvement in symptoms after a pre-operative course of treatment with iodine, sedatives, fluids and glucose for ten days to three weeks is usually pro-

nounced. But if in the face of adequate preparation there is no improvement in pulse rate, B.M.R., and weight loss, or if diarrhoea or vomiting takes place, the case is a serious one indeed.

C. During operation.

Even during operation a hitherto good risk may develop signs or complications which augur ill for the patient's post-operative course.

1. Anaesthetic. The necessity of large amounts of oxygen or anaesthetic indicates a rising combustion rate in the body. A prolonged anaesthetic makes for increased post-operative reactions.

2. Pulse and Blood Pressure. A rising pulse rate after the patient is under the anaesthetic and an increase in blood pressure, particularly pulse pressure are serious signs.

3. Trauma and Bleeding. Excessive trauma and hemorrhage of even slight amounts of blood have a far greater effect in producing shock in the hyperthyroid patient, and together with a prolonged operative time of more than one hour, predispose to subsequent crisis.

D. After operation.

Not even yet may vigilance be relaxed, for in steering the patient through the post-operative period, the course is still befraught with dangers, particularly during the first forty-eight hours.

1. Asphyxia. A not uncommon post-operative complication due to laryngeal paralysis, spasm or edema, to injuries of the trachea or to hemorrhage in the neck. Even moderate asphyxia will frequently precipitate a thyroid crisis.

2. Psychic Changes. Any change in the patient's psychic state should be accepted as an indication of the onset of a possibly serious thyroid state.

3. Nausea or Vomiting. Nothing will more certainly foretell the onset of thyroid crisis than the appearance of nausea or vomiting, whether it is due to other causes or to the intoxication itself.

The Crisis

The onset of thyroid crisis or storm may take place in two or three hours but more commonly over a period of twelve to forty-eight hours. It occurs most frequently during the second twenty-four hours after the operation.

The patient appears restless at first, tossing about wildly. Then he may become delirious, being totally unaware of his surroundings, and finally may pass into a state of coma. The respiration is increased and becomes strained. The patient appears livid, the skin is deeply flushed, hot and bathed with perspiration. Diarrhea and vomiting, often the prelude to crisis, may continue throughout its duration. The temperature climbs rapidly from normal to 105 or even 107 degrees in a few hours. The pulse rate increases sharply up to 200 or to rates uncountable.

The underlying physiology responsible for the metabolic conflagration of thyroid crisis is simple. The manifestations of hyperthyroidism can be attributed to the increased combustion of the normal supplies for fuel in the body, namely the glycogen stores. In thyroid crisis such combustion is not only increased but the glycogen stores are exhausted and the combustion of the tissue proteins themselves further increases the intoxication throughout the body. The dehydration, commonly coexistent, only adds to the vicious circle already established.

With this understanding of the pathogenesis of thyroid crisis, the intelligent management of this emergency becomes obvious.

Prevention

Once a severe thyroid crisis sets in, most cases terminate fatally, and for many years no dependable means could be found that would prevent these fatalities. It was only in 1922 when Plummer discovered the efficacy of pre-operative iodine therapy that the incidence of thyroid crisis became drastically reduced so that now it is a relatively rare occurrence.

A. Pre-operative measures.

1. Iodine. Lugol's Iodine, min. 5-10 three times a day, is now always given before any operation on the thyroid gland.

2. Rest and Sedation. Rest in bed with quiet surroundings, skilful reassurance

and sedation by bromides or codeine can by themselves improve the patient tremendously and these measures should never be neglected.

3. Diet. With the increased metabolic requirements in hyperthyroidism, the patient should on no account be starved as this will precipitate a thyroid crisis even before the operation. The diet should be concentrated and of high caloric value. The carbohydrates in the diet should be abundant in order to replenish the depleted glycogen stores in the liver and also to provide fuel for the increased combustion and so save the body tissues. Adequate proteins in the diet are also indicated by the low plasma proteins in these patients.

4. Fluids. In severe cases there is often dehydration which should be combated by a high fluid intake, even by intravenous administration if there is nausea or vomiting.

The duration of the pre-operative course of treatment varies from ten days to three weeks or more, depending on the response of the patient. Here again the clinical manifestations of pulse rate, activation, weight and psychic state are more reliable indices than the B.M.R. taken by itself. A response may be considered fair, even if the B.M.R. is unchanged, if a clinical improvement takes place.

B. Stage operations.

Performing thyroidectomy in several stages, each one of as little disturbance to the patient as possible, was, prior to Plummer's method of iodization, the chief means of reducing the incidence of thyroid crisis. This complication is, however, still the most frequent cause of death in the thyroid patient and many of these cases can be saved by stage operations. Unilateral lobectomy followed in six weeks by removal of the other lobe, or in very severe cases preliminary ligation of one or both lobes, has been shown to reduce the mortality in dangerous risks.

C. Postoperative.

Routine postoperative care includes the continuation of Lugol's Iodine, adequate fluids, high caloric, high carbohydrate diet and sedation with morphia as required.

In cases where the contributing factors or premonitory signs are present before, during or after the operation, the above methods should be intensified if one is to prevent a crisis.

Management of Thyroid Crisis

Once restlessness, rising pulse rate and temperature usher in a thyroid crisis, one must resort to heroic measures to extricate the patient from the ravages of an almost explosive increase in combustion and heat production in the rapidly dehydrated body.

1. Refrigeration. The patient is kept in a cool, if not cold room. The use of an oxygen tent is an efficacious means, both of reducing the patient's temperature and of relieving dyspnoea. Ice bags on all sides of the patient are indicated when the temperature goes to 103° or more. In extreme cases, some advocate packing the entire body with chipped ice, separated from the patient only by a thin protective sheet. Covering the patient with a sheet only and spraying the sheet with cold alcohol is an effective adjunct to dissipate the heat. Ice water enemas may be given at intervals in extreme cases.

These measures are very shocking to the patient and should not be used in old or debilitated cases. Even in young patients in good condition the danger of pneumonia is considerable.

2. Fluids. To the fluid loss of excessive perspiration is often added that of diarrhoea or vomiting. The dehydration must in all cases be controlled by continuous intravenous administration of fluids, about 4000-5000 cc's. per 24 hours until the patient can maintain an adequate fluid intake by mouth.

3. Glucose. The administration of glucose is as essential as fluids and should also be given continuously, the intravenous fluid consisting of 5 per cent glucose. The patient should have a total of 500-800 grams of glucose in 24 hours which is attained by frequent additions of 50 per cent glucose intravenously.

If the patient is vomiting it is best to

give also the iodine intravenously, 50 drops of Lugol's Iodine per 1000 cc's. of intravenous fluid.

4. Forced Feeding. The intravenous glucose alone is inadequate to supply the caloric requirements of a patient in thyroid storm; therefore feeding of a high caloric, high carbohydrate diet per os must be continued even by nasal catheter if necessary.

5. Sedation. Morphia is the best drug to use in these cases and should be given in large doses at frequent intervals. In young patients in good condition, basal avertin has been advocated during a crisis.

If the case is complicated by other conditions such as fibrillation, heart failure, diabetes, acute infections or anemia, the treatment must be modified accordingly.

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A PROBLEM IN DIAGNOSIS

Continued from page 275

This patient presented an interesting problem in the differential diagnosis of the causes of obstructive jaundice. The most likely cause of the obstruction in order of frequency was: (1) Carcinoma of head of pancreas or common duct. (2) Benign stricture of common bile duct. (3) Stone in common bile duct.

With the history of previously having had gall stones, the probability of leaving one behind in the common duct was not too remote. However, the time interval of appearance of symptoms made this diagnosis more unlikely. Pain is also a common accompaniment of this condition. Also, that she might have developed a stricture following exploration of her duct was a probability, but the symptoms would more likely have appeared sooner. The points in favour of a diagnosis of malignancy involving the biliary system or head of pancreas were: (1) the length of time since her operation, (2) the irregular lower border of her liver, (3) the onset of painless jaundice in an elderly patient, (4) the complete and permanent obstruction of flow of bile into the duodenum.

Operation

At operation the liver was somewhat enlarged and cirrhotic in appearance. The common duct was aspirated and found to contain clear yellow fluid. A probe could be passed downward into the duodenum but on attempting to pass it upward, an obstruction was met in the common hepatic duct. The liver around this area was quite hard and a biopsy was taken. The pathological report was *Secondary Adenocarcinoma of the Liver.* The tumor was of an adenocarcinomatous character with the acini being small and lined by cuboidal atypical epithelial cells. This tumor had originated in the bile ducts with extension into the liver from which the biopsy material was obtained.

Discussion

The diagnosis in this case as proven at operation was *Carcinoma of the Bile Ducts with extension into the Liver.* This condition is not so rare but that one must consider it in the differential diagnosis of any case of obstructive jaundice, particularly of painless jaundice. When the growth occurs in the common duct below the origin of the cystic duct, the diagnosis is often mistaken for carcinoma of the head of the pancreas as one expects to find a large distended gall bladder in each case. However, the diagnosis was rendered more difficult here because a cholecystectomy had been done previously.

An accurate pre-operative diagnosis is rarely made because the clinical manifestations are so inconsistent. The first symptom is usually the insidious development of jaundice associated with dyspepsia and occasionally mild upper abdominal pain. The condition is often confused with stones in the common duct, but the latter condition is usually associated with more severe pain and fluctuation in the severity of the jaundice. The onset of jaundice in carcinoma of the bile ducts is as before stated, gradual, but with cholelithiasis it is usually quite sudden. The obstruction to the flow of bile into the intestinal tract is more complete and permanent with carcinoma than with a stone in the common bile duct.

FRACTURES OF THE UPPER END OF THE FEMUR

By G. E. P. WILSON, '40

The most common fracture of the femur is one in the vicinity of the neck. Formerly these fractures had a high percentage of disability and while many aspects of this problem are still unsolved, great advances have been made in the last few years.

The essential idea underlying the treatment of all fractures is the function of the part. In the lower extremity, it is primarily that of weight-bearing and the shifting of the body, known as locomotion. This is in contradistinction to the aims of treatment in fractures of the upper extremity in which flexibility and range of movement are essential. Thus an inch of shortening, or a ten degree angular deformity may be allowed in the humerus, while in the femur, it would constitute a real disability. In the case of the femur, considerable risk is taken to secure adequate anatomical restoration, even to the extent of breaking down impacted angulation, which would not be warranted in a humerus. As in fractures of the other parts of the body, the rules governing treatment must be obeyed, namely—reduction, adequate immobilization, and return of function.

In the understanding of this fracture, the peculiarity of the anatomy and blood supply play an important part. There are five chief sources of blood supply to this general bony region.

(1) From the ligamentum teres, which is scant and is sometimes missing.

(2) Numerous large vessels from the capsular attachments.

(3) Small short vessels from the capsular reflections and synovial membrane.

(4) Numerous and good sized nutrient vessels.

(5) From the extensive muscle attachments in the intertrochanteric region.

The intact neck of the femur is thus far from deficient in circulation. The complicating factor is that all, or the major part of the circulation to the fracture site, must often be derived from soft-part sources outside the bone and not from the nutrient vessels, once fracture has occurred.

Thus a subcapital fracture, if complete, should be deprived of all blood supply save through the ligamentum teres. Similarly, an intertrochanteric fracture will have its blood supply relatively intact. The blood supply then decreases in passing towards the head. On the other hand, I know of one surgeon who gave up using bone grafts for subcapital fractures because they were being absorbed in the head before in the shaft, and breaking off.

Etiology

These fractures occur ordinarily in elderly persons and more frequently in women. The greater tendency to fracture in these persons is explained by the decalcification of the bone secondary to changes due to age and decreasing bodily activity. In addition, there is a marked decrease in the organic constituents of the bone. These factors, in addition to the multitudinous types of strain and violence to which the bone is exposed, explain the different varieties of fractures which occur. The fracturing violence is of two types: the first type occurs with very little violence, such as a mis-step on the stairs, stepping from a street curb, or a slight stumble. The bone yields and the patient falls to the ground, the fracture having occurred before the fall.

The second type is brought about by a fall, which is not broken by the outstretched arm and direct violence occurs against the greater trochanter. As on many other points in this subject, there is also disagreement on the etiology, but it is hard to believe that there are many people walking on femurs so weak that a stumble will produce a fracture.

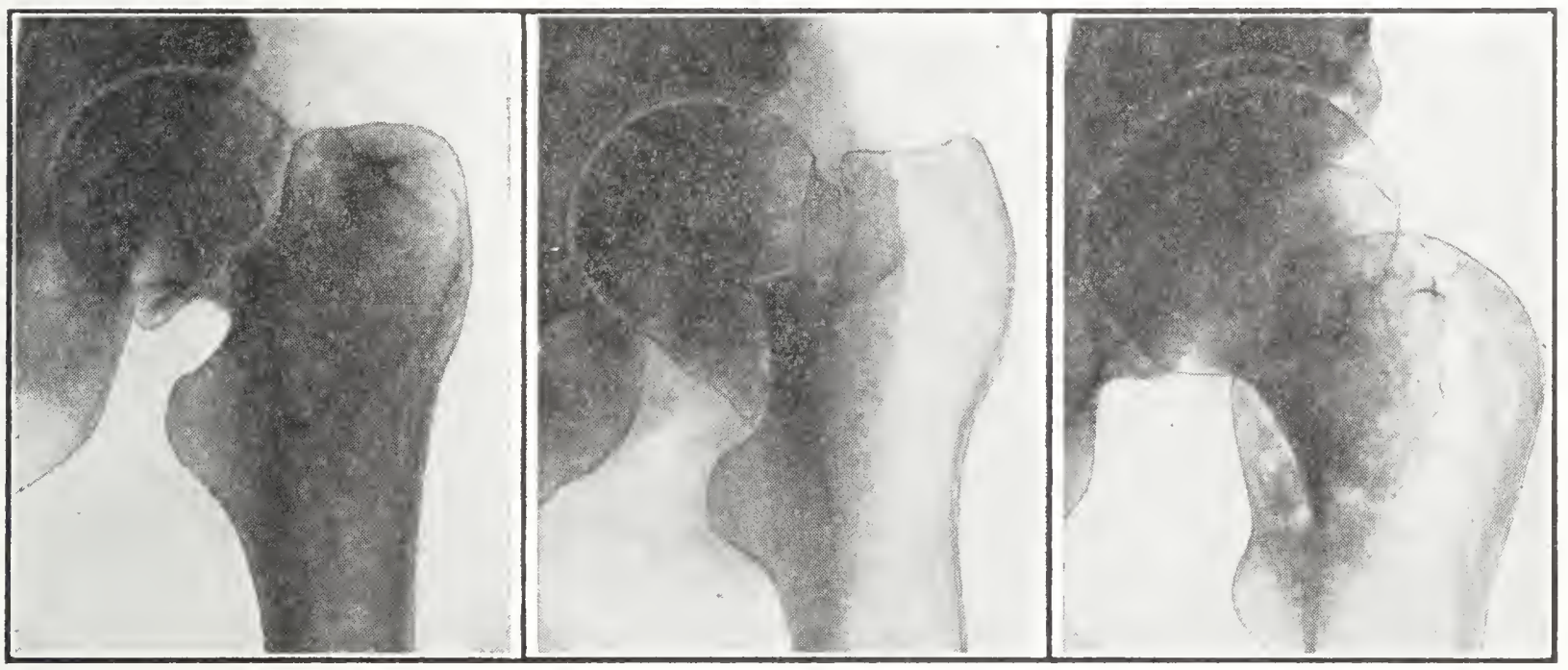
However, any complaint of hip pain

following trauma in an elderly person, places on the doctor the burden of proving that there is not a fracture of the femoral neck, even though the patient can walk, and no deformity is apparent.

Classification

There are four places where fractures are very likely to occur in the upper extremity of the femur: just below the head; in the middle of the neck; at the base of the neck; and near the line joining the trochanters. These may be called:

(1) Subcapital
(2) Midcervical (Transcervical)
(3) Pretrochanteric
(4) Intertrochanteric



Subcapital Fracture | Transcervical Fracture | Intertrochanteric Fracture

One and two each occur in about 25% of cases, and three and four, grouped together, constitute 50% of cases.

Deformity

In these fractures, there is no characteristic deformity. However, in the subcapital and midcervical varieties, a common displacement occurs. The upward pull of muscles running between thigh and trunk, plus the weight exerted through the pelvis, if walking is attempted, shorten the leg. The force acting against the greater trochanter, causes the weaker posterior part of the neck to give way. The ilio-psoas muscle when the neck is broken, acts as an external rotator and the natural tendency of the leg to roll outwards produces external rotation. Thus the fractured surfaces tend to face anteriorly, and the deformity is one of coxa vara or shortening and external rotation. Coxa Valga is less common, and it may cause apparent lengthening of the leg.

Signs and Symptoms

The history is usually that of an elderly person who in walking, slips or trips, falls to the ground, and complains at once of acute pain on moving the hip. The leg lies in a helpless state, everted and perhaps shortened.

(a) *Signs of local trauma* may or may not be present, tending to be more severe in the intertrochanteric variety.

(b) *Crepitus*, present if the fracture is unimpacted, but must not be unduly sought for.

(c) *Loss of power* may be slight if fracture is impacted, when patient may walk on injured leg.

(d) *Eversion* tends to be less in the subcapital type, due to capsular resistance.

(e) *Shortening*—usually ½″-1″ in the subcapital type, but may reach 2″-3″ in the intertrochanteric.

(f) *The position of the greater trochanter* is of greatest importance. It may

be demonstrated by elevation above Nelaton's line or by shortening of the line drawn from tip of trochanter perpendicularly to a line dropped from the anterior superior spine. A simple method is to place the thumbs below the anterior superior spines and the middle fingers firmly on the tops of the trochanters. The distance on each side between the middle fingers and thumbs is now compared, with care being taken that the hands have the same relative position to the pelvis.

(g) *Relaxation of the Ilio-Tibial band.*

Treatment

Subcapital fractures: Forty years ago, old and weakly patients with this fracture were put to bed for a few days, the leg supported by sandbags, and then encouraged to get about on crutches as soon as possible to prevent hypostatic pneumonia. The more hardy individuals were kept in bed 8-10 weeks and a Liston's splint applied. This was a long padded board which extended from the axilla to 6″ below the ankle and the patient was bandaged to it. In a certain number of cases union occurred, but then in the cases where impaction was present, union occurred regardless of treatment. However, the splint is still useful as a first aid measure.

The first real advance was made by Royal Whitman in the treatment of the subcapital and midcervical types. Extension was applied to the lower fragment and the fragments were then locked together by full abduction and internal rotation of the limb. A plaster cast was then applied, extending from the opposite axilla, including the pelvis and the whole of the injured limb. The knee was flexed forty-five degrees in order to control internal rotation. The patient was encouraged to get up on crutches and after 8-12 weeks, the cast was removed and massage and movements started. A weight-bearing caliper was then worn for six months.

Leadbetter improved on this for the treatment of mid or transcervical fractures, which are harder to reduce. The hip was flexed to ninety degrees and lifted upwards before being internally rotated, abducted and extended.

The Whitman spica technique had, however, many disadvantages. The knee was immobilized for many months, and many elderly patients developed intractible stiffness. Immobilization was sometimes necessary up to 6-12 months, and it was difficult to maintain immobilization in obese subjects. Muscle retraction caused shearing movements, bony decalcification occurred, and in many cases aseptic necrosis (Phemister), due to injury to the blood supply. Few surgeons, by this technique, could claim bony union in more than 40% of cases.

Following the Whitman spica, internal fixation was attempted. All manner and shape of nails and screws were used, but with little success. In 1927 Smith-Petersen introduced a three-flanged, stainless-steel nail which is the basis of our treatment today. He exposed the fracture and head of the femur by open operation and drove the nail in from below the trochanter. By this method, he obtained complete immobilization, and the number of cases of bony union was doubled.

However, the operation carried with it considerable shock and damage to the blood vessels of the capsule and it has now been replaced by the extra-articular method of nail insertion. There are several main essentials for the operation. The nail must be of exactly the right length so that it is sufficiently buried in the head to afford complete fixation and yet not project into the joint surface. It must be placed almost in the middle of the fragment and not break out of the head or neck, and it must be made of non-ionizable metals or loosening will occur. Active movements should be started as soon as it is deemed advisable.

The fracture is reduced by either the Whitman or Leadbetter technique, and X-ray plates taken to confirm the accuracy of the reduction. A heavy guide-wire is then driven from below the trochanter along the middle of the neck of the femur into the head. The length and position of the wire is checked by antero-posterior and lateral X-rays. The

length of nail required is now easily estimated. The length of wire buried in the bone is found by subtracting the length projecting from the total length. If the wire has not penetrated to the necessary depth, the required length of nail may be easily calculated because the magnification of the bone is equal to that of the known length of wire buried in it. If necessary, the wire is withdrawn and reintroduced until a satisfactory position is obtained. A cannulated three-flanged nail is threaded on to the guide wire, held in a punch and hammered in until its head lies flush with the cortex, care being taken that the wire is not being driven in with the nail. An impactor punch is then used to close any gap which may have formed at the site of the fracture when the nail first strikes the proximal fragment. Rotation of the head is prevented by the wire. A crosspin may be passed through the head of the nail to prevent longitudinal sliding. A final pair of X-rays are taken and the wound closed. This method is a modification of that first described by Johansson. Usually no splint is necessary.

Movements of the knee are begun the day after operation to prevent stiffness of the joint and muscles and the patient may sit up in a day or two. Weight-bearing at one time was allowed within a few days, but the general concensus of opinion is now that it should not be allowed before 2-3 months. The nail need not be removed unless it is causing symptoms.

There are many methods of fixation other than by the three-flanged nail. Among the most notable of them are the Austin-Moore multiple wire nail fixation when four wires are used, and Henderson's lag-screw fixation. This is a screw which prevents angulation and rotation and impacts the fragments by pulling them together. There are now about fifty different types of directing apparatus for inserting a three-flanged nail and most of them are very simple and accurate. A particularly ambitious one is used by Wilson of St. Michael's Hospital.

The routine treatment is as follows:

On admission, the leg is immobilized in a Thomas splint with Buck's extension and about a twenty pound weight. This is left on for several days until, if the patient is old, he has recovered from his shock, and is used to lying in bed. An X-ray plate is then taken with the legs parallel and the toes pointing straight upward. The neck of the good leg is measured from below the greater trochanter to the most proximal point of the surface of the head, and it has been found that if ¾″ is deducted, this will be the length of the required nail.

The patient is given a spinal anaesthetic and an incision made on the outer side of the trochanter. The fracture is reduced by the Whitman technique, and checked by feeling the fracture line through the capsule. The nail is now guided by a machine. It consists of two claws which pull together and clamp on the neck and another claw which fits against the shaft just below the greater trochanter. The claws join a main bar on which are the tightening wheels and a guide grooved to hold a Smith-Petersen nail which has no central cannula. The claws are tightened, the guide pushed against the femur, and a nail inserted and driven home. A strap is placed around the other hip to apply counter pressure and to prevent the head from rotating when it is struck by the nail. The side of the femur is now struck a few times with a heavy wooden mallet and punch to impact the fragments. The reason for this is that the two fragments tend to move apart as the nail is inserted, in much the same manner as two boards when they are nailed together.

The Thomas splint with Buck's extension is reapplied with a ten-pound weight, and X-ray plates taken in two directions to check the position. The leg is kept in the splint for four weeks as an extra precaution against the femur riding up. At the end of four weeks, the extension is removed and active exercises and massage commenced. The patient is kept in bed till there is evidence of union in the X-ray plate. This usually occurs in about four months.

The main advantage of this method is that it does away with the guide wire and numerous X-rays, thus reducing the time of the operation and shock to the patient.

In good hands, the operation may be done in 15-20 minutes. In taking X-rays, the good leg is flexed, the filament is placed against the inner side of the injured leg and the plate on the outer side.

Transcervical fractures are treated in the same manner, but owing to better blood supply to the fractured area, union occurs sooner than in the subcapital variety—usually in about three months.

Intertrochanteric fractures: These fractures are almost invariably the result of direct violence acting transversely upon the greater trochanter. Impaction of the head and neck into the junction of the trochanter and shaft is common, but there may be comminution with the production of many fragments. The fracture is characterized by a free blood supply to both sides of the fractured surface, and a wide area of fractured surface so that rotation and shearing stresses are reduced. Consequently the results are better than in the subcapital variety.

Treatment

If possible, these fractures should be nailed. The technique is the same as in the subcapital variety and union usually occurs in about three months. Occasionally, however, the distal fragment is too small or comminuted for nailing. A Thomas splint with Buck's extension is applied with abduction and about twenty-five pounds weight. This is kept on for ten weeks, then removed and the patient is allowed to move around in bed for another two weeks. If the limb is not immobilized for this length of time, the callus will soften with a consequent varus deformity.

Thus with modern methods of treatment, what was once a hopeless fracture, can now be compared favourably in results with fractures of other parts of the body.

Jenner, A Country Gentleman

In 1798 Jenner published his little monograph announcing the prophylactic value of vaccination. Three years later when the fame and value of his discovery could no longer be denied, even within the sacred portals of fashionable London medicine, Mr. Cline of St. Thomas's Hospital wrote Jenner asking him to come to London and promising him a glittering financial return in the proposed practice. Jenner, the English countryman to the core, replied as follows:—

'Shall I, who even in the morning of my days sought the lowly and sequestered paths of life, the valley and not the mountain; shall I, now my evening is fast approaching, hold myself up as an object for fortune and for fame? Admitting it is a certainty that I obtain both, what stock should I add to my little fund of happiness?'

And he added in memorable words this clear appraisal of life which deserves a greater currency among posterity than it has achieved.

'And as for fame, what is it?—a gilded butt forever pierced with the arrows of malignancy.'

Historical Bulletin, Feb. 1940
Calgary Associate Clinic

PNEUMONIA IN INFANCY AND CHILDHOOD

A CLINICAL STUDY

By ALFRED M. CROSSLAND, '40

To one who is accustomed to see and deal with pneumonia in adults, the first experience with a case of pneumonia in an infant is apt to be a surprise. He, who suspecting pneumonia in an adult, on taking an accurate history and carrying out a careful physical examination, keeping in mind the clinical picture of pneumonia and its typical findings, can usually make a correct diagnosis both as to the presence of pneumonia and as to its character whether lobar or lobular. This same individual on the other hand is much distressed to find that his mental picture of pneumonia as seen in the adult is of little value in aiding his diagnosis of the same illness in infancy. One can be seriously misled by the apparent lack of diagnostic signs present in an infant ill of pneumonia.

The young doctor called to see a sick infant finds that the question with which the mother is most concerned has to do with prognosis. This makes the diagnosis between pneumonia of lobar type and lobular (bronchopneumonia) type of great importance, as the prognosis in the first mentioned type is excellent whereas in the later type the prognosis is guarded. The factors principally concerned in determining the type of pneumonia are:

1. Nutrition. If the child is undernourished, the pneumonia is apt to be lobular.

2. Age. The younger the child the less resistant, and so we find that under 2 years, 75 per cent of pneumonias will be lobular in type and over 3 years, 75 per cent will be lobar.

In general, the differentiation of types depends almost entirely on the resistance of the host.

To assist the young doctor in his diagnosis, the following points are helpful to keep in mind:

1. Primary (so called) and Secondary: A pneumonia which sets in suddenly with very little antecedent infection is likely to be a lobar case, whereas a pneumonia occurring after a long debilitating disease is lobular as a rule.

2. Pleurisy: (as indicated by pain in the chest). This is seen most commonly in lobar pneumonia. As a rule there is no clear fluid found in the chest as is commonly met with in adults. If one finds evidence of fluid in the chest in a child ill with pneumonia, that fluid is almost certainly pus.

3. Cough: This is much more constant in bronchopneumonia than in lobar pneumonia, and is more distressing; sometimes it is almost incessant. This then is different from adults.

4. Dyspnoea and Cyanosis: These signs are almost exclusively seen with bronchopneumonia, whereas in adults they are seen fairly commonly in lobar pneumonia. There is real dyspnoea in many cases of bronchopneumonia as indicated by the marked recession of all the soft parts of the chest, and the dilatation of the alae nasi on inspiration. Cyanosis when present, always is serious and may be an indication for oxygen.

5. Onset and Termination:

a. if the onset is slow, the pneumonia is likely lobular.

b. if the termination is by crisis, it is lobar.

c. if the termination is by lysis, it may be either.

d. if there is a sudden onset, it may be either.

Types

Lobar pneumonia cases are usually divided into the following types:

1. Short duration: Pneumonias of this type last only about two days and clear up rapidly.

2. Long duration: Cases of this type last about ten days to two weeks, otherwise they are the same as type one.

3. Cerebral: As will be shown later, these cases commence with symptoms predominately cerebral in nature, and are often confused with meningitis.

4. Concealed: These cases were formerly called central but the actual pathology is really the opposite, being situated at the periphery and not being detected until the disease has extended more centrally into the lung.

Bronchopneumonia is divided into the following types:

1. Primary: Cases of this type have an onset not unlike lobar cases and on the whole their prognosis is not as bad as the rest of the types of bronchopneumonia.

2. Secondary: These are the cases of bronchopneumonia coming on after long debilitating diseases or fevers. They carry a heavy mortality.

3. Chemical: Substances such as zinc sterate powders have been known to cause bronchopneumonia.

4. Aspiration: Cases of this type usually follow the aspiration of foreign bodies such as peanuts and foods, or occur postoperatively.

5. Terminal: Many illnesses terminate with a bronchopneumonia contracted while in bed as the result of low resistance.

6. Traumatic: Result from injuries such as rib fractures, etc.

7. Rare Types: Such as Lipoid pneumonia, etc.

Clinical History

In a typical case of lobar pneumonia, a child three or four years of age, after a few hours of slight indisposition, suddenly begins to vomit and this is followed by a rapid rise in temperature. He is dull and apathetic, complains of headache and general weakness, refuses food, and is easily persuaded to remain in bed. Occasionally sharp pain in the side is complained of. The skin is dry; there is marked thirst, restlessness, and other symptoms which accompany fever. The temperature is found to be 104°F. or even higher; the respirations 40 to 50 a minute; the pulse full, strong, and 120 to 130. On the second day the patient is no better. The temperature remains high; cough is present and may be quite frequent.

After the second or third day the patient is usually more comfortable and sleeps better, but may be disturbed by the cough. At times there is restlessness and at night there may be slight delirium. The respiration continues rapid and the temperature high. There is little change until the sixth or seventh day, when, after a long sleep, the patient wakes, decidedly improved as to all his symptoms. There is less fever and the temperature continues to fall rapidly until it touches the normal line, or it may even drop below this. As the fever subsides the pulse drops to 90 or 100, and the respirations to 25 or 30 a minute. The appetite soon returns, and convalescence is rapid.

The doctor when called to see a sick baby may find, possibly not to his surprise, that the parents can tell him very little to help him in his diagnosis. In fact he must really be on his toes to avoid being misled by symptoms and signs apparently pointing to a diagnosis in another direction. For instance it is difficult to detect pleural pain in a child and not infrequently this pain is referred to the abdomen. At once the possibility of acute appendicitis comes strongly to mind. There are several babies operated on each year in Canada for acute appendicitis who are really suffering from pneumonia. Again, cough and expectoration are often slight or absent simply because children under five years almost invariably swallow their sputum. Often the onset of the illness is abrupt, being preceded only by a short spell of the common cold, when a sudden exacerbation of fever and increasing cough with rapid respiration mark the onset of pneumonia. By observing the respirations one will notice that the usual ratio of respirations to pulse of one to four has now altered to one to two.

An associated gastro-intestinal upset may often lead one to presume that a simple bowel upset or infection is at fault. Seldom but occasionally, the onset of the illness is marked by symptoms that are chiefly cerebral in origin. Thus the onset is with convulsions and the child rapidly passes into delirium or perhaps coma. Meningeal symptoms may be conspicuous; opisthotonus, irregular pupils, irregular respiration, rigidity of the neck, retracted abdomen and a positive Kernig sign. Without a lumbar puncture it is often impossible to exclude meningitis. When the spinal fluid is examined it is found to be under high tension, but as a rule there are no organisms and either a slight increase in cells and globulin or none at all. Secondary bronchopneumonia does not present cerebral symptoms as commonly as does lobar pneumonia. Convulsions are rare at the onset but may occur at the close.

Secondary bronchopneumonia occurs as a sequela of the infectious diseases—measles (generally when the eruption appears);—whooping cough (most frequently from the third to the fifth week, rarely in the first two weeks);—scarlet fever; diphtheria; etc. In children, bronchopneumonia forms the most serious complication of these diseases and in reality causes more deaths than are due directly to the infectious fevers. It is most fatal during the first two years of life.

Bronchopneumonia of the apices in a child persisting for three or more weeks, particularly if it follows measles or diphtheria, is often tuberculous.

Physical Signs

In addition to the physical signs already mentioned, the following points are useful to keep in mind.

Inspection.

1. General Appearance: The child ill with pneumonia will usually have a characteristic look of preoccupation about him. He appears to be only interested in breathing; your examination does not interest him at all.

2. Breathing: One of the most instructive clues as to the presence of pneumonia is the breathing of the child as he lies quietly in bed. A raised respiratory rate out of proportion to the pulse is undoubtedly of great importance and yet it is so easily overlooked or underestimated. For example, in a child ill with measles the only clue as to the presence of pneumonia coming on as a complication is a sharp rise in the respiratory rate. In lobar cases the breathing may be simply accelerated but more often it is of the inverted type. This is most characteristic and can be easily recognized with a little experience; a quick expiration which is accompanied by a grunt is followed by a short inspiration and then a pause.

Examination of the Chest.

1. The earliest sign to be observed is simply *a diminished respiratory murmur.* Unless one is accustomed to examining infants' chests frequently, he is in danger of forgetting the quality and strength of the breath sounds in a normal infant, and so when confronted with an early case of pneumonia this first sign will likely be overlooked unless it is kept in mind. The diminished respiratory murmur is due to early congestion of the part, in consequence of which less air enters this portion and more air enters the rest of the lung. This will intensify the normal respiratory murmur heard over normal lung. The physician may be misled into believing this to be bronchial breathing and so diagnose the pneumonia on the wrong side!

2. *A burst of fine crepitant râles at the end of inspiration.* This is an important sign and must be diligently sought for. Often the râles are present but for a few hours, and they may be missed altogether.

3. Just as important to establish is a *higher pitched note* to the breathing in the pneumonic area. This can definitely be made out in early cases and is of great aid in diagnosis. In hospital cases treated early with sulphapyridine, all that may be left of the physical signs even as early as the first or second day after treatment, will be this higher pitched note to the breath sounds in the pneumonic area.

4. Percussion reveals *diminished resonance* over the affected area, and exaggerated resonance over the remainder of this lung and the opposite lung. This sign is not of such practical importance as the preceding ones. It may be well to note here that the percussion note in small children is often best elicited by slapping the chest with extended fingers.

5. X-ray in cases of lobar pneumonia shows the presence of consolidation early, usually first at the surface of the lung, gradually extending inward as the disease progresses. Bronchial breathing is not usually obtained until the consolidation has reached the hilum of the lung.

6. In the stage of consolidation there may be demonstrated a small localized patch of pure bronchial breathing.

7. In cases of bronchopneumonia the physical signs show a wide variation. This type of pneumonia may often occur without signs of consolidation at any period during the course of the disease. One of the first signs may be more widespread distribution of coarse râles which later change to fine râles. At the same time the respiratory murmur heard over a large area of lung or diffusely throughout the whole chest becomes feebler and of a higher pitch.

8. As a general summary we may say that if the physical signs are limited to one part of the chest, the pneumonia is lobar.

Complications

1. **Empyema.** This is characteristic of lobar pneumonia. There seems to be little doubt that the empyema is present from the onset of the pneumonia. Cases that start with severe pleurisy will generally (75%) go on to empyema. This complication must then be always kept in mind in children who suffer considerably with pleurisy at the onset. The diagnosis can usually be made without seeing the child as it is the rule, first to get a history of severe pleurisy and then a glance at the temperature chart will give the diagnosis. It will be seen that the pneumonia has terminated by lysis and a few days later the temperature has risen and is now remittent in type as shown by the wide daily swings in temperature. The physical signs are:

1. *Flatness on percussion*—this is very important and can often be determined best by using the whole hand to slap the chest.
2. *Diminished movement on that side.*
3. *A shift of the mediastinum* to the opposite side by tracheal shift.

These are the three most important signs. Also, there may be an increase in the polymorphs to about 90% of the differential count. The cough becomes paroxysmal in type. The breathing may be distant or bronchial in character. The râles tend to clear up. In a young infant, collapse of the lung must be ruled out. In all cases under two years of age, it is wise to treat them by aspiration only. Otherwise in the treatment of the empyema, other measures to establish empyema, other measures to establish adequate drainage may be considered if necessary.

The incidence of empyema is 8% and the mortality is about 20%.

2. **Bronchiectasis and Lung Abscess.** These are complications of bronchopneumonia and are not considered here. Pericarditis and otitis media are more infrequent complications.

Diagnosis

In the majority of cases the symptoms are plain and the physical signs so typical that it is difficult to overlook pneumonia if any degree of care is used in the examination of the patient. The difficulties in diagnosis are due to the great variation in the general symptoms, and to the late appearance of the physical signs. The error usually made is to mistake pneumonia for some other disease, rather than to mistake some other disease for pneumonia. Because of its frequency in children, pneumonia should always be excluded before accepting any other explanation of a continuously high temperature. The rule should be followed, in all cases of acute illness, to make a thorough examination of the chest daily until the diagnosis is clear. If a rapid respiration and marked

leukocytosis are added to a high temperature, one should always suspect pneumonia, no matter what the other symptoms may be. It not infrequently happens that the general symptoms are quite characteristic and yet the physical signs appear late. In such cases pneumonia should always be looked for high in the axilla or just beneath the clavicle.

In their onset, scarlet fever, tonsillitis, and many acute infections may resemble pneumonia. From all other general diseases, pneumonia is to be differentiated especially by the physical signs. The confusion with appendicitis and meningitis have been pointed out. Often it happens that pneumonia complicated by empyema is confounded with unresolved pneumonia. This should not occur if due regard is paid the previously mentioned aids. Tuberculosis sometimes gives rise to difficulties in diagnosis. This must be watched for and carefully eliminated in doubtful cases. Marked enlargement of the spleen and liver are more typical of tuberculosis as is also a large central shadow in the X-ray. The skin test is also a help in some cases.

Treatment

A full discussion of the treatment of pneumonia is not attempted in this article. The results with sulphapyridine have been striking. About 45 grains a day are given but the doses vary with the age and size of the individual. Usually this can be dropped to 30 in two or three days and still further depending on the concentration of the drug in the blood. The reader is referred to more detailed sources for the average doses, the danger of poisoning, etc.

The general rules for feeding all sick children should be observed. As a rule, medicine should not be administered in the food. Food should not be forced when the patient is suffering only from thirst. Water should be allowed freely at all times. Diet as tolerated is given. It helps to keep a case of bronchopneumonia in warm moist air but a lobar case can have fresh cool air. Counter-irritants by means of mustard paste can be used but may be more annoying than helpful. Most children with pneumonia receive too much treatment.

Lobar pneumonia has a strong tendency to recover in the great majority of cases, regardless of the treatment adopted. Over three years of age the mortality is 3% and this is made up mostly of the cases complicated by empyema. Under two years of age the mortality is 9%. The mortality of bronchopneumonia is approximately 20% in practise.

The author wishes to express his sincere thanks to Dr. E. A. Morgan of the Sick Children's Hospital for his helpful assistance and criticism in the preparation of this article.

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A DISCUSSION OF THE CONTRACTURES DESCRIBED BY VOLKMANN AND DUPUYTREN

By G. R. WALKER, '41

During the last century two contractures were described, one by a Frenchman and the other by a German, which still occur and are of importance in modern surgery. They differ widely in their appearance, etiology, age incidence, and many other respects.

VOLKMANN'S CONTRACTURE

In 1875 Dr. Richard von Volkmann, a professor at Halle in Germany, listed the causes of muscle atrophy and among them mentioned a contracture of the wrist due to ischemia as a result of tightly bandaging an arm in the treatment of fractures about the elbow. He made the important observation that the paralysis occurred simultaneously with the contracture and thus differed from the late contracture following a primary nerve lesion.

Etiology

Volkmann considered the condition to be due to an obstruction of the arterial supply to the affected muscles. This view was accepted until 1915 when Bardenheuer suggested that venous obstruction was an important factor and that due to a carbon dioxide accumulation in the veins, the endothelial wall was damaged and the blood plasma permeated into the muscles causing the damage.

A great deal of experimental work has been done in attempting to determine the causative factors. Brooks in 1925 showed that obstruction of an artery alone did not produce a condition of fibrosis and contracture, but a flaccid paralysis with or without necrosis. Jepson produced a claw hand contracture in animals by venous obstruction alone but it was not permanent. Raffele was able to produce a typical ischemic type of contracture in animals by constriction and fixation of a previously fractured limb.

It has been shown that a nerve lesion is not essential for the production of the deformity and that any nerve lesion present is a secondary condition, in many cases due to prolonged pressure on the nerve,—usually the median or ulnar, as the radial nerve is deep—causing a degeneration which usually recovers fairly rapidly.

Middleton showed that the venous return from the flexors of the forearm converges in the cubital fossa to form a single vein, which could easily be compressed by a hematoma in the fossa.

The usual treatment of supracondylar fractures by acute flexion and plaster bandage are important etiological factors in causing obstruction. Poor reduction and manipulation of the fracture, by increasing the hematoma, increase the pressure in the cubital fossa and hinder venous return. The condition may occur in persons with hemophilia without a fracture being present.

A fracture and the resulting hematoma may in themselves be sufficient to cause the condition when no treatment is given. This is important from the medico-legal point of view.

Deformity

Due to contracture and fibrosis of the flexor group of muscles in the forearm, there results a typical deformity as follows:—The muscles on the anterior aspect of the forearm are wasted, the wrist partially flexed, the metacarpo-phalangeal joints partially or completely flexed. The effect on the thumb is variable, but usually it is adducted and the interphalangeal joint acutely flexed.

Further flexion of the wrist permits the fingers to be partially or completely extended, and extension of the wrist causes further flexion of the fingers. This phenomenon proves that there can be no tendinous adhesions and that the defect

must be due to a contracture of the flexor muscles or their tendons.

In practically all cases there is a glove-shaped area of anaesthesia, extending a variable distance proximally. This tends to recover but may leave a residual sensory loss corresponding to the distribution of the ulnar or median nerves due to involvement at the fracture site. Trophic changes may occur if the sensory loss is severe but tend to heal rapidly after the correction of the deformity. These account in part for the frequent presence of scars in old cases.

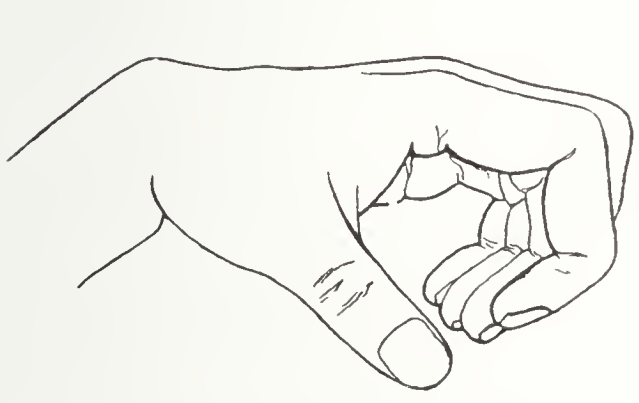
The affected limb fails to grow as quickly as the normal, and any growth which does take place increases the relative shortness of the flexors and therefore increases the deformity.

the flexors and the development of the claw hand. The contracture increases over a period of months or years.

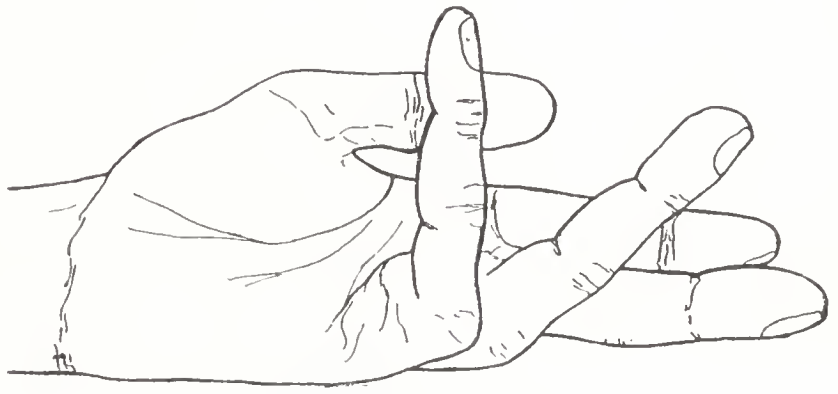
After the condition is fully developed there is little or no power in the affected muscles and they are hard, atrophied, cord-like and inelastic. The hand is useless and deformed. Pronation and supination are impaired, the hand tending to remain pronated. Motion at the elbow is limited due to the contracture and/or to incomplete reduction of the fracture. The degree of deformity varies with the extent of involvement and the duration of the damage.

Pathology

The condition is an interstitial myositis of the muscles of the forearm resulting in



Deformity in Volkmann's Contracture.



Deformity in Dupuytren's Contracture.

Incidence

The condition occurs most commonly in children 4 to 12 years of age following fractures in the region of the elbow, usually a supracondylar fracture of the humerus. It is rare in adults and occurs about equally in males and females. It may also result from fractures in the region of the knee with resulting deformity in the leg.

Stages in Development

The usual course of events is that following the reduction of a fracture in the region of the elbow and the application of a plaster bandage, the fingers become cold, cyanotic, and swollen. Power of movement and sensation are lost. The arm is usually very painful. Pulsation may be absent at the wrist. This is the acute stage which is followed by contracture of

contracture and fibrous replacement of muscle. The process may be considered in two stages, the acute stage and the stage of contracture.

The acute stage is characterized by edema, cyanosis, infiltration by leucocytes and their accumulation in the interfibrillary spaces, loss of nuclei in the sarcolemma, loss of both transverse and longitudinal muscle striations, irregularity of contour of the myofibrils and finally a loss of separation of the individual fibres of the muscle, i.e., myolysis, leading to atrophy and fragmentation of the fibres. This reaction occurs when the arm is painful, swollen and cyanotic and begins in the first two days. The condition is patchy and leaves areas of relatively normal muscle closely associated with areas of degeneration.

The stage of contracture begins shortly after the acute stage but continues for

several months or longer. There is gradual absorption and destruction of the disintegrated fibres by small round cells described by Raffele, which penetrate the damaged fibres and phagocytize them. The muscle is replaced by fibrous tissue derived from surrounding connective tissue elements.

Vessels and nerves may be found imbedded and constricted in the fibrous masses. Ossification of the damaged muscle occasionally occurs. Any remaining muscle tissue reacts normally to electrical stimulation.

Prognosis

The prognosis depends on the stage at which the condition is recognized and treatment instituted. Unless recognized very early, complete recovery cannot be expected. If contracture has occurred the prognosis is poor, as with the best of treatment the arm will always have some deformity and the flexor muscles have some lack of power.

Treatment

The condition is better prevented than treated. The possibility of this condition must be born in mind in the treatment of all fractures in the region of the elbow. There is some disagreement as to whether supracondylar fractures should be reduced immediately or after swelling has partially subsided. The usual practice is to reduce the fracture immediately but if the swelling is considerable the arm should be left in a partially extended position for at least two days. In any case the patient should be kept under observation in hospital for 48 hours.

If the condition develops and is recognized in the acute stage all possible means should be taken to prevent its progression. All splints and plasters should be removed, the arm partially extended and elevated. Murphy recommends that several vertical incisions should be made in the deep fascia of the arm to relieve the pressure.

Several methods are used in the treatment of the condition after the contracture has occurred. Since contracture is a passive condition and not active, as is spastic contraction in spastic paralysis, continuous counterforces are required to overcome it. The resistance increases, not decreases, with improvement and it thus differs from spastic conditions. In 1908 Robert Jones advised gradual extension first of the fingers and later the wrist. This treatment is still used in most cases and requires several months. X-ray treatment is given to the fibrous tissue to hasten stretching. After extension is complete, splints are worn, first all the time and later a part of the time in an attempt to maintain the extension. The contracture tends to recur.

If this conservative treatment fails, several operations have been devised to improve the deformity. Unless some power of contraction remains in the muscles there is little use in attempting to improve the position of the hand as it will always remain useless. The most useful operation is that described by Page in which the origin of the flexors is divided from the medial epicondyle and allowed to slide into the forearm where it finds a new attachment. Other operations as the lengthening of all the flexor tendons and removal of sections from the radius and ulna do not give as satisfactory results. When there is a nerve involved in the scar tissue, it may be necessary to free it to restore its function. Skin grafts are used to improve areas damaged by scars.

Cases

During the last five years, fifteen cases of Volkmann's contracture have been treated in the Hospital for Sick Children. These have come in from many parts of the province. Eight of these were in males and seven in females. The ages ranged from four to twelve years. Eleven occurred in the arm and four in the leg. The majority were treated by gradual extension, by placing the hand and forearm in a plaster cast divided at the wrist and causing gradual extension at this division.

Summary

Volkmann's contracture is a not-infrequent condition occurring following

fractures in the region of the elbow and knee. It is due to a group of factors, chief among which is venous obstruction. It results in a replacement of muscle by fibrous tissue and contracture of the fibrous tissue, causing a typical deformity in the forearm and hand. The process is rapidly progressive and once started, all attempts to check it are of doubtful value. It must be thought of in treating all fractures in the regions of the elbow and knee in order that its development can be anticipated and its occurrence prevented. Treatment after the condition has developed never gives complete recovery. The most usual form of treatment is gradual extension as recommended by Jones in 1908.

It must be remembered that the condition can occur even in cases where no treatment is given, but even in these cases it is possible that its development can be prevented.

DUPUYTREN'S CONTRACTURE

Guillaume Dupuytren, who is considered the founder of clinical surgery in France, in his "Leçons orales de Clinique chirurgicale faites a l'Hotel-Dieu de Paris" in 1832-34 described a contracture occurring in the hand as a result of a thickening of the palmar aponeurosis.

Development

There appears first a nodule usually at the base of the fourth or fifth finger which gradually increases in size and spreads to the whole palm and down the sides of the fingers causing the metacarpo-phalangeal and proximal interphalangeal joints to be flexed. The distal joint is usually extended. The thumb is seldom involved. There is little or no pain associated.

Etiology

Many conditions have been suggested as: trauma, heredity, gout, arthritis, infection, diabetes, nerve injuries, and syphilis. Trauma, heredity, and chronic infection either in the hand or elsewhere in the body are most frequently the outstanding factors in the history and probably the chief factors in the etiology although this has never been proven.

Dr. H. Couch of Toronto reported the case of identical twin brothers in whom the condition occurred at the same age, in the same fingers of the same hand, and of the same severity. The suggestion is made that "the contracture is due to a variation in the growth of the palmar fascia, the potentiality for which is inherited."

Pathology

Dupuytren stated "From the very beginning of the disease a cord is felt on the palmar surface of the finger and hand, which is drawn tighter when an effort is made to straighten the fingers. The palmar fascia is in a state of thickening, contraction, and tension, and from its lower portion something like cords proceed to the sides of the affected fingers."

At first only the fascia is involved but later the overlying skin is affected. There is a loss of subcutaneous fat and in the late stages the skin is wrinkled, hard and calloused and fixed to the fibrous mass. As acute flexion occurs the joint surface is altered and the joints may become fixed. The power of extension is eventually completely lost. The fascia stands out on the surface of the palm. The joint capsules may be contracted and prevent extension even when the fascia is removed. The tendons to the fingers are not involved.

Incidence

In a series of cases reported by Meyerding in 1936, the average age of development was 54 years with no cases under 17. Eighty-eight per cent occurred in males and 12% in females. It occurred in both hands in 65% of cases, and the right hand in 25% and the left hand 10%. Forty-five per cent of cases were in manual workers.

Treatment

Sir Wm. Fergusson in his System of Surgery, 1842, stated: — "The fascia should be dissected out at once. An incision should be made over the whole of

the contraction, and if the integument is tolerably soft and thick it should be turned off on each side so as to expose the fibrous tissue, which should then be carefully taken away. . . . The utmost care should be taken to avoid the nerves and blood vessels at each side of the finger and if the operation can be satisfactorily effected without opening the sheath or touching a tendon, so much the better." This is essentially the same treatment as is followed today. Under a bloodless field, obtained by means of a tourniquet, the affected fascia is completely removed. If the skin is extensively involved it may have to be excised and a full-thickness graft applied. Care must be taken of the vessels and nerves, which are usually bound down in the fibrous tissue. Kaplan believes the condition is due to thickening and shortening of the superficial longitudinal fibres of the aponeurosis and suggests that these only need be removed. This is not the general view and both the above fibres and the septa passing dorsally from them, which are also usually thickened, should be removed for satisfactory results.

A. B. Gill of Philadelphia has pointed out that any chronic infection if present in the hand or elsewhere in the body, should be treated before operation.

In some cases X-ray therapy prevents progression and causes some softening. It is used when operation is impractical. Smith of Buffalo uses X-ray therapy combined with subcutaneous fasciotomy with very satisfactory results.

Summary

Dupuytren's contracture is a gradually developing thickening and shortening of the palmar aponeurosis usually starting on the ulnar side of the hand. It occurs in adults and more frequently in the male. The etiology is uncertain, although trauma, heredity, and infection appear to play an important role. Treatment as a rule is surgical and if done early is very satisfactory.

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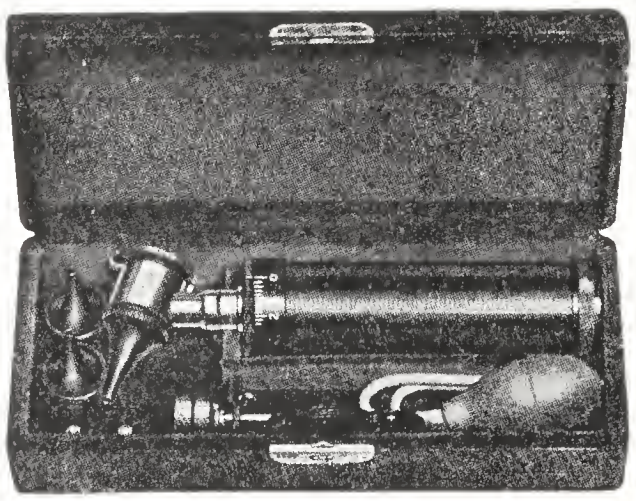

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INTESTINAL TUBERCULOSIS

PATHOLOGY AND DIAGNOSIS

By HILSON BURNETT, '41

Despite the advances made in the treatment of pulmonary tuberculosis beginning with the epochal work of Dr. Trudeau at Saranac Lake, New York, it still remains fifth in causes of death in all age groups in this country, and since intestinal tuberculosis is the most common complication of pulmonary tuberculosis, quite often being the actual cause of death, it can be seen that this is by no means so rare a disease as the writer was at first prone to think.

History

By and large, the history of intestinal tuberculosis falls into four periods:

I. The *"Dysentery"* period, during which it was noted that diarrhea frequently occurred late in the course of pulmonary tuberculosis, but little consideration was given to the fact that it might be due to the same disease in a different organ. This, the period of Clinical Observation, extended from the time of Hippocrates to that of Bayle (1810).

II. The period of *"Tuberculosis Diarrhea"*, during which the lesions in the intestine were described and noted as tuberculous and the diarrhea definitely connected with them. This period of Pathological Observation extended from the time of Bayle to the time of Louis and Rokitansky (1842).

III. The period of *"Pathological Study"*, during which the pathological changes were fully described and attempts made to connect the varying symptoms with the various changes in the lesion found at post-mortem. The diagnosis during life was always uncertain. This period lasted from the time of Louis and Rokitansky to 1919.

IV. The period of *"Roentgenological Diagnosis"*, during which the diagnosis and consequently the scientific study and treatment of intestinal tuberculosis could be accurately pursued, dated from the beginning of the work of Brown and Sampson at the Trudeau Sanatorium to the present day. This is the period with which we are concerned.

Etiology and Pathology

The haematogenous theory of intestinal infection has been discarded by most observers due mainly to the fact that there has never been any evidence of tuberculous involvement of the blood vessels, either gross or microscopic.

Infection most likely occurs from swallowed sputum containing large numbers of tubercle bacilli in patients with pulmonary infection. Furthermore, the localization of the lesions about the ileocaecol valve where the lymphoid tissue is most abundant and where the rate of movement of intestinal contents is slowest, also favours the enterogenous origin.

Intestinal tuberculosis may be either:

1. *Primary* in mucous membrane, or
2. *Secondary* to disease of lungs.

Primary:

Most frequent in children and more common in Europe than America. It is very rare in this country. The etiological agent is usually the Bovine type and it is commonly transmitted in unpasteurized milk. At the Trudeau Sanatorium only one case was described and at the Munich Pathological Institute it only occurred once in 1,000 cases.

Secondary:

This is the most common complication of pulmonary tuberculosis being found in 50-80 per cent of all autopsies done on patients dying of pulmonary tuberculosis.

The lesions are either ulcerative or hyperplastic.

A. Ulcerative lesions:

These occur most often in the terminal ileum, caecum and ascending colon (85%) but the whole bowel from duodenum to rectum is not immune. In the ileum the Peyer's patches are involved and the ulcers are ovoid and not transverse to the long axis of the bowel. In the colon the ulcers are usually transverse to the long axis of the bowel, because in spreading, the process follows the distribution of the lymphatics, this is also the case when the jejunum is involved.

The ulcers tend to be multiple with an irregular, serpiginous outline, ovoid or girdle-like. The edges and base are infiltrated and very often caseous. The submucosa and muscularis are usually involved in the small bowel, while in the large bowel the ulcers are as a rule shallow. The edges of the ulcer are always undermined. The serosa next to the ulcer is thickened and may contain young tubercles.

The earliest lesions, whether tubercles or minute ulcers, occur at the summit of a lymph follicle. They are at first grey and translucent but caseation sets in and the nodule becomes yellowish. At this stage the mucous membrane may necrose and burst to form a crater-like ulcer.

Microscopically the follicle is first infiltrated with round cells; the cells run together within the follicle to form a translucent mass, the area of caseation. The perifollicular infiltration is in 3 zones; the first composed of lymphoid cells; the second of proliferated connective tissue cells and blood vessels and the third zone of lymphoid cells and spindle cells. Many polymorphs and some giant cells are found in the periphery of the caseated area. The small arteries have a cellular infiltration about them, their walls thicken, the lumen narrows or disappears and the surrounding zone undergoes hyaline degeneration. This endarteritis obliterans aids in the extension of the ulceration. The veins are not affected. There is evidence of degeneration of the ganglion cells of Auerbach's plexus which may be responsible for the increased peristalsis.

The mesenteric glands which almost always contain tubercles, bear no relation to the severity of the process in the bowel. In isolated ulcers of the large bowel they are but little or not affected at all. In one hundred cases Engelsmann found these glands affected in 56. Minute ulcers of the bowel must always be looked for when the mesenteric glands are involved.

B. Hyperplastic:

The hyperplastic lesions always occur in the ileo-cecal region, often include the appendix, and are rare in comparison to the ulcerative lesions. The process is a formative one with formation of granulation tissue in the submucous and subserous coats. The mucosa is folded and nodular and projects into the lumen causing narrowing which is sometimes extreme and is easily mistaken for malignant obstruction. The bowel is thickened, firm and stiff and due to involvement of the regional lymph nodes, it may be mistaken for carcinoma at operation.

Diagnosis

I. Clinical signs and symptoms:

These are extraordinarily variable and unfortunately for the patient and the physician, resemble at the onset those produced by fleeting disturbances of no moment.

(a) *Pain* is the most constant symptom, in one series of cases being present in 42 out of 45. It may at first be transient and noticed only after meals but later becomes more persistent occurring from day to day, being of a crampy or stabbing character, aggravated by food and relieved by fasting. It occurs either in the epigastric region or the right lower quadrant.

(b) *Diarrhea* in some instances is the first manifestation of the disease. The number of stools daily may reach ten or more. The cause is either the increased peristalsis or interference with the absorption of water from the intestinal contents. The relation of the site of the lesion to the diarrhea has not been definitely determined as it varies from case to case. Some observers believe catarrhal

and secondary inflammatory changes are responsible for the diarrhea.

(c) *Constipation* is almost as common a symptom as diarrhea and is probably due to spasm of the bowel. Alternating diarrhea and constipation are sometimes present at the onset of the disease.

(d) *Temperature and pulse* may be normal or slightly elevated. Temp. to 99.5-100 degrees F. Pulse 80-90.

(e) *Gastric disturbances* vary all the way from heartburn and disturbances of appetite to nausea and vomiting. Occasionally the only symptom may be persistent vomiting, even of liquids.

(f) *Loss of weight* is very severe with emaciation and weakness being marked, especially when the diarrhea is persistent.

(g) *Intestinal haemorrhage* is rare but macroscopic blood is not uncommon. Sometimes tarry stools may be noticed. The probable cause of the infrequent haemorrhage is the endarteritis obliterans that involves the vessels in the floor of the ulcers before their wall is destroyed. In Parsons' and Adams' series of 52 cases a positive Guaiac on the stools was only obtained 5 times.

(h) *Marked mental depression and unaccountable nervousness* is a frequent occurrence in some patients.

(i) *Palpation of the abdomen* reveals nothing in 50 per cent of cases. In the other half a mass may be felt in the right lower quadrant or there may be general abdominal tenderness. Sometimes a tender mass of mesenteric lymph nodes may be palpated.

II. Laboratory findings:

(a) *The presence of tubercle bacilli in the faeces* is not of much help since they are present in nearly every case of pulmonary tuberculosis with bacilli in the sputum. Even if the bacilli are not in the sputum there is some evidence that they may be excreted along with the bile. The films are stained by Ziehl-Neilsen's method and one negative report should not carry any weight but the bacilli should be sought for several times.

(b) *In the blood* the haemoglobin and red count are reduced and the white count is usually slightly increased. In a series of cases by Parsons and Adams of the Massachussets General Hospital, 52 with intestinal tuberculosis never showed a red count below 3.8 M, while 52 cases with carcinoma of caecum and colon all had red counts below 3.5 M, a minor point of distinction.

(c) *The urine* is negative without involvement of the kidneys or urinary bladder.

III. Roentgen-ray examination:

(a) *The barium meal* usually reveals general hypermotility with complete or nearly complete emptying of the colon in twenty-four hours; failure of the caecum or of the ascending colon and hepatic flexure to retain the barium; or the presence of spasm or filling-defects. Sometimes confirmed segmentation with or without dilatation of some coils of the small bowel; ideal stasis and gastric retention are more obvious. The intestines are studied at the third to the tenth hour and again at the twenty-fourth hour after taking the meal. These findings indicate ulceration only, but when pulmonary tuberculosis is present, tuberculous ulceration can be safely diagnosed.

(b) *The barium enema* usually confirms the fact that the caecum or portions of the colon may fail to receive or to retain the barium.

The following conditions should be kept in mind when interpreting the X-ray films.

(1) *Carcinoma*—may produce a similar filling-defect to that seen in tuberculous colitis and in its early phases may also produce the hypermotility. Proximal delay and stasis in later cases of carcinoma is never seen in tuberculous ulceration. In Parsons' and Adams' series of 52 cases of carcinoma, only 4 were wrongly diagnosed as tuberculosis preoperatively.

(2) *Chronic appendicitis.* Adhesions produced by inflammation about the appendix can very easily deform the outline of the caecum and should be kept in mind.

(3) *Amoebic dysentery.* Sprue and non-tuberculous ulcerative colitis produce the same shadow complex as that seen in tuberculosis and it may be impossible to differentiate them. The non-tuberculous ulcerative colitis lesions tend to be lower down in the colon but may extend to the caecum.

(4) *Actinomycosis* is usually in the caecum when present and has to be distinguished from the hyperplastic type of tuberculosis; a filling defect is usually seen in the plate. Sulphur granules in the stools confirms actinomycosis.

(5) *Diverticulitis.* A circular spotted effect produced by the barium remaining in the diverticula, following the barium meal, and hypermotility may be present.

Complications and Sequelae

The frequency of complications depends upon the time the diagnosis is made and when the treatment is begun. It is striking how few complications are noted clinically when treatment is instituted early.

1. Secondary infection in ulcers of lower ileum, caecum and colon due to prolonged contact with the faeces. Such ulcers are accompanied more frequently by a rise in temperature and marked tenderness. Perforation and abscess formation are more likely to occur in this type.

2. Intestinal haemorrhage is by no means common but when present may be sufficient to produce macroscopic blood or tarry stools. Occult blood occurs in many early cases.

3. Perforation. Since a localized peritonitis is one of the first effects of ulceration, complete or partial perforation can result, usually giving rise to a generalized peritonitis or to a faecal abscess. Characteristic signs are an increased temperature with a sudden severe pain in right iliac fossa or epigastrium, rigidity, nausea and vomiting and a rapid pulse. Death is usually rapid.

4. Stenosis. Attempts at healing of the ulcer may result in the formation of much connective tissue, which contracts, narrowing the lumen of the bowel and bringing about stenosis. Symptoms may be slight or absent and none are characteristic. A pain which is regular after each meal and colicky in character is often the case. If obstruction becomes complete one gets a steady pain, nausea, faecal vomiting and death unless surgical interference is called upon.

Summary

1. Suggestive symptoms of beginning intestinal tuberculosis include, among others, any digestive disturbances, marked constipation, failure of the pulmonary condition to improve, an irregular temperature with subnormal fluctuations, and possibly decrease of pulmonary symptoms when the patient is not doing well, alternating constipation and diarrhea, and marked nervousness.

2. Tubercle bacilli in the stools are of little diagnostic aid, as they occur in 85 to 95 per cent of all patients with tubercle bacilli in the sputum.

3. As the symptoms and abdominal examination are so often negative and clinical diagnosis so uncertain, we must turn to the X-ray studies of barium meal and enema to exclude intestinal tuberculosis.

4. No moderately advanced case of pulmonary tuberculosis can be assumed to have been thoroughly examined unless a roentgen-ray study of the bowel has been made. This is the only method which will diagnose intestinal tuberculosis in its incipiency or exclude it at any stage.

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THE CLASSIFICATION AND TREATMENT OF BURNS

By D. J. VAN WYCK, '42

Burns may be caused by any substance which radiates heat and result from proximity to, or direct contact with, hot solid bodies, super-heated gases, inflammable liquids, or molten metals. Scalds are caused by boiling water and other liquids or super-heated steam. The difference may be roughly compared to the difference between roasting and boiling. Explosions, friction, acids, alkalies, mustard gas, electricity or over exposure to radiation whether ultra-violet, radium or roentgen rays, can all produce lesions typical of the exciting agent but all are broadly classed and treated as burns.

The degree of burning which results depends on:—

(1) Degree of temperature.
(2) Nature of exciting agent and its heat capacity.
(3) Duration of contact.
(4) Susceptibility of part affected and condition of subject.

Only burns and scalds will be considered in this paper but in general the principles outlined below may be applied to lesions produced by the other etiological agents mentioned.

Classification and Pathology

Differentiation into degrees of severity of burn is a convention adopted for convenience in outlining pathology, clinical manifestations and prognosis. There are several types of classification in general usage but the one most commonly employed is Dupytren's Method which will be used here. This classification divides burns into six degrees of severity as follows:—

(A) First Degree:

This is simple erythema resulting from exposure to a temperature of 140° F. A momentary contraction of arterioles is followed by vasodilatation and widening of the capillary bed, due to a local release of histamine. The area becomes red, hot and painful with slowing of the blood flow and congestion of the part. There is margination of leucocytes, diapedesis and localized inflammatory edema. There is no actual destruction of epidermis and no vesicle formation A bright erythematous flush lasts from thirty-six to forty-eight hours after which the upper layer of epidermis separates and later peels off. The part may show redness for a week or more but no scars remain. The basal layers of the skin rapidly repair themselves. Any resultant pigmentation soon disappears. This degree is the usual result of transient heat over the part such as would follow gas explosion or exposure to sunlight.

(B) Second Degree:

This is one of vesication and is due to exposure to a temperature of 160° F. to 210° F. The epidermal cells have undergone a coagulation necrosis and there is exudation of fluid into the epidermal layers. This collection of fluid is thought to be due to the liberation of a histamine-like substance which alters capillary permeability and allows blood plasma to escape into the damaged epidermal layers whose walls are stretched, distorted and finally dissolved by the accumulating fluid. The line of separation is in the epidermal layers.

Exudation is accompanied by mononuclear infiltration. Rapidity of blistering is dependent on severity of heat application as some cases form large bullae instead of minute vesications. When the cuticle or blister skin has been removed, the exposed dermis is red and painful and from the surface there is a continuous weeping discharge. Soon epithelialization takes place from the undamaged basal cell layer. Very slight scarring will result even if the corium has not been involved but this will disappear in time. The area may remain red and pigmented for a month or more.

(C) Third Degree:

The epidermis is completely destroyed along with the upper layers of dermis. This is the most painful type of burn as terminal nerve filaments are left exposed. Tips of papillary processes remain intact however, appearing as red points on a white ground. From these, regeneration of epithelium takes place. Sweat and sebacious glands and hair follicles likewise escape damage. The subpapillary venous and lymphatic plexuses remain and absorb toxins formed in the damaged tissues. Repair requires from two to four weeks. The length of time required bears no relation to the size of the defect. The resulting scar is white and elastic, possessing all the elements of true skin and undergoing no contracture.

(D) Fourth Degree:

This involves the entire epidermis and part of corium without damage to underlying subcutaneous tissue. The burn is brown and discoloured if heat produced, and marble white if scalded. It is insensible to touch, depressed, contracted and causing the surrounding area to be drawn in and puckered. At its edge the burn shades off into third and second degree.

In fourth degree burns, healing begins as an acute inflammatory process by a separation of dead from living tissue. The entire necrotic area must be sloughed off; a process requiring from two to four weeks for its completion. The depth of the burn may be determined by the depth at which bleeding takes place since all damaged vessels are thrombosed. When separation is complete, the underlying raw surface is covered with granulation tissue-proliferating fibroblasts and capillary endothelial loops. This granulation tissue may become so abundant as to hinder healing and make the resultant scar thick and protruberant, and keloid formation is common. Gradually epithelialization takes place as a thin bluish film of epithelial cells grow in over the granulation tissue from the periphery at about one-eighth of an inch per week.

(E) Fifth Degree:

This involves skin and subcutaneous tissue. There is no essential difference from fourth degree except that the surface is more deeply charred and the resultant scar is immobile due to the loss of intervening elastic connective tissue and fixation to underlying structures. The muscles show loss of function depending upon the degree to which they are involved. The scar shows a tendency to break down and ulcerate.

(F) Sixth Degree:

This is merely an extension of the preceding two types to deep muscles, tendons or even bone. The entire limb shows disorganization and charring of tissues. This results in complete loss of function of the part involved. Fingers and toes are most often affected by this type of burn.

Clinical Course

Superficial burns involving less than 10% of the body surface are not likely to arouse a constitutional reaction. More severe burns, however, are accompanied by more or less definite general disturbances. For the sake of convenience, these disturbances will be discussed in four stages although a sharp differentiation is purely artificial as they tend to overlap and show great variety of symptoms.

(A) Primary Shock:

This initial shock appears immediately on receipt of the injury provided it is severe enough, and is nervous in origin. The clinical features are prostration, subnormal temperature and blood pressure, pallor, cold skin and rapid, thready pulse. In most cases it is only very slight in degree and passes off quickly to be followed by a period during which the patient appears normal even where extensive lesions are present. It is not a serious factor in death rate following burns.

(B) Secondary Shock:

This is the stage of collapse and primary toxaemia and may develop from stage

one without any interval or after a latent period of six to twenty-four hours. Its severity bears a direct relation to the size of the area burned. Collapse from secondary shock is always more serious for children than for adults and is responsible for 80% of deaths from burns.

Theories concerning causes of shock resulting from severe burns are many and varied but it would appear from cross circulation experiments and other researches that the cause is toxic. Protein cleavage products due to partial breakdown of the damaged tissues under the influence of heat, and subsequent autolytic processes, are absorbed into the blood stream to affect the whole body. Degenerative lesions in the gastro-intestinal tract, nervous system, heart, lungs, liver, kidneys, suprarenals, spleen, bone marrow and lymph glands have been demonstrated as caused by this toxaemia. The gastro-intestinal lesions include minute petechiae from which blood loss occurs. In addition one must consider the tremendous fluid loss which also takes place from the surface of an extensive burn. One observer reports that 70% of the total blood volume was lost over a period of 24 hours from a burn involving one-sixth of the body surface. With this exudation or transudation there is reduction of blood volume, reduction of chlorides and loss of blood proteins.

The clinical picture of acute toxaemia varies according to the degree of toxicity and possibly to differences in the chemical constitution of the toxins. The temperature rises, often abruptly. In children it usually reaches and remains at a high level. Temperatures of 106° F. are not uncommon and higher temperatures have been recorded but these are usually only seen just before death. The patient becomes drowsy, the pupils dilated and the colour dusky or livid. Vomiting is a common feature, the vomitus having frequently a coffee-ground character. The latter is an indication of the gastro-intestinal lesions. Blood pressure is low, pulse rapid and thready, and respiration rate is increased. The course often progresses rapidly through delirium and coma to death.

(C) Third Stage:

The stage of infection or septic toxaemia. As most burns are self-sterilizing at the time of injury, the great danger from infection lies not in the burn itself, but in the area surrounding the burn. Infection occurs from forty-eight hours to ten days after the injury and is first noted at the margins of the burn as a red area exuding sero-pus or frank pus. It is accompanied by septic manifestations, headache, vomiting, rapid pulse, and pyrexia may be followed by chills. The symptoms are those of ordinary bacteriogenic toxaemia and vary according to the extent of the affected area and the virulence of the organisms. The third stage may be practically absent if the degree of infection is so slight as to give rise to no general or local disturbances. On the other hand, severe infection may cause death. However, mortality from this cause has been greatly reduced under proper treatment. If adequate surgical cleansing is done soon after the injury and a protective dressing applied, the effects of infection are minimized. The most common infecting organism is a haemolytic streptococcus. Therefore, chemotherapy plays a part here. Scarlet fever antitoxin is also of value.

(D) Fourth Stage:

The stage of healing begins when infection is overcome, and the duration depends largely upon the depth of the lesion. First and second degree lesions heal quickly without the formation of scar tissue, whereas in third degree lesions the surface becomes covered with epithelium which is derived from the edges and scattered epithelial islets which have escaped destruction.

The cicatrix is greyish-white and supple, showing little tendency to contract. In areas which have been more deeply burned, healing is slow, since the epithelium which is to cover the granulations has to grow from the edges. On account of the tendency of scar tissue to contract, deformities and disability may follow. Sepsis, by destroying the epithelial islets, may add greatly to the scar tissue forma-

tion. When the wound finally heals, the scar undergoes contracture becoming tough, thick and inelastic. This excessive cicatrization cannot be prevented in deep burns, but with avoidance of sepsis, proper splinatge, skin grafting and remedial exercises, it can be greatly minimized.

Management

The management will be considered under two headings; prevention and treatment of systemic reaction, and care of local lesion.

Prevention and Treatment of Systemic Reaction

The factors to remember here are: relief of pain, relief of shock, replacement of fluid loss, and prevention of infection. If shock is present, the patient will not suffer from pain but if there is no shock, the pain is likely to be intense. Adults are given morphine ¼ gr. and children, tinctura opii 2 min. per year of age. If present, shock takes precedent over any other condition save haemorrhage. Its treatment: heat, sedatives, rest, and fluids. Danger from infection may be anticipated from the first by the administration of Anti-Tetanic Serum, Scarlet-Fever Antitoxin, Sulphanilamide, Dagenan, etc.

Dehydration accompanies severe burns, indeed it has been blamed for secondary shock. Replacement of fluids maintains blood pressure, neutralizes toxins, relieves concentration of the blood and aids kidney function which is depressed during shock. Concentrated serum has been found useful to replace serum lost by exudation as it raises the osmotic pressure and helps to maintain blood volume. Exsanguination transfusions are no longer used. Instead, whole blood is given by transfusion whenever the patient is anaemic or has lost much blood from haemorrhage. Intravenous saline and glucose helps to restore lost chlorides. Cortin or Percortin and Pitressin are vasco-constrictors which, by raising tonus, help bring up the blood pressure and reduce fluid loss in the region of the burn. Fluids are also administered per os, by duodenal tube if vomiting is present, or intravenously at 100 ccs. per kg. of body weight per day until the capillaries have regained their normal tone. Excess fluid is readily excreted as soon as the circulation is re-established.

Care of Local Lesion

In 1925, Davidson of Detroit introduced Tannic Acid for the treatment of burns and since that time its use has spread all over the world. Since its introduction the mortality following burns has dropped from 32% to 12%. Tannic Acid is at once safe, simple and effective, combating in one procedure all the symptoms and sequelae of burns whatever the degree. Tannic Acid is a readily soluble powder possessing mildly astringent properties but it has little or no antiseptic power and if kept for long in solution, changes to gallic acid and is useless for burn treatment.

Due to its astringent properties, Tannic Acid coagulates the devitalized tissues and seals lymphatics. If used in a weak solution, it can penetrate the entire depth of the burn fixing toxins, preventing fluid loss, promoting analgesia and aiding in prevention of shock. It forms a tough protective coagulum over the injured area, providing immobilization and protection from infection. All this simplifies nursing care and shortens somewhat the period of hospitalization.

It has some drawbacks however:

(1) It may destroy islets of epithelium, hair follicles, and sweat glands which might otherwise have survived, thus necessitating skin grafts.

(2) Infection developing beneath it may be overlooked, or may gain ready entrance through a crack in the hard coagulum.

(3) In solution it rapidly deteriorates and it is not germicidal.

(4) In deep burns, the coagulum is apt to adhere to underlying structures, necessitating surgical removal.

In order to overcome some of these objections, silver nitrate is now sprayed on to supplement the action of tannic

acid. The coagulum forms in one-fifth of the time required for the acid alone and at the same time an effective antiseptic has been applied. In the absence of tannic acid, strong tea may be employed as it contains from 2% to 5% tannic acid. Davidson employed 2% to 5% solutions, but nowadays 5% to 10% solutions are advocated.

The acid must be applied within the first few hours after the burn occurs. It is best applied by the spray method or as a compress. Gels and baths are also used.

Tannic Acid Spray: After the area has been thoroughly cleansed, the patient is placed on sterile linen. General anaesthetics, though used during surgical cleansing, are not advocated any longer because of possible respiratory complications. Instead, heavy sedation with opiates is employed alone. If the burn is in the region of a joint, the limb is first fixed in full extension, as immobilization is essential and contractures must be avoided if possible. The part is then sprayed with 5% Tannic Acid solution. In an emergency an ordinary "flit-gun" may be used. For the first four hours the patient is sprayed every fifteen to thirty minutes and thereafter every three or four hours until a firm, smooth coagulum is formed, but it must not be too thick. Too rapid drying must be avoided. This can be done by employing a wire "cage" or cradle fitted with lamps to supply heat and to keep the bedclothes away from the area. If infection does not supervene, the coagulum begins to peel off (in the case of superficial burning) in from ten to fourteen days. If the burn is deeper and the coagulum has become fixed, it will remain considerably longer and when it comes away will leave a large granulating surface. In case the coagulum must be surgically removed, Davidson cautions against softening with moist dressings beforehand as this may lead to release of imprisoned toxins, and absorption. If infection occurs, as evidenced by a floating coagulum, pain and a rising temperature, drainage must be instituted and the part treated like any infected wound.

Tannic Acid Compress: When the burn is so situated that the spray method is not applicable, a compress may be substituted. Several layers of gauze or linen cut to extend beyond the margins of the affected area, are soaked in a 2% to 5% solution, and applied to the burn. They can be removed and resoaked from time to time until a firm coagulum is formed. The balance of treatment is the same as when spray is used.

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THEORIES OF SLEEP

By J. P. G. MAROOSIS, '43, and W. S. SEDGWICK, '43

Without thee what is all the morning wealth?
Come blessed barrier between day and day,
Dear mother of fresh thought and joyous health.

WORDSWORTH.

Sleep, eulogized in poetical fancy; blamed by theological superstition as the time when the soul leaves the body, returning only to the righteous and pure; minutely investigated by long series of brilliant physiologists and psychiatrists, resulting in an intricate superstructure of conflicting theories, still remains basically a mystery. This article attempts a review of the physiological phenomena involved and an inclusive summation of the theories as to the causation and significance of sleep.

Pieron defines sleep as "a suspension of the complex motor activities that bring the organism into relationship with the environment. The suspension of activities being dependent on internal necessities and not on external conditions and involving the preservation of the ability to be aroused or awakened.

Physiological Phenomena Associated with a State of Sleep

The period of minimal activity called sleep is common to all parts of the body. During normal deep sleep in a healthy individual, the metabolic rate is reduced as much as 15%. The blood pressure is reduced, the systolic pressure showing a decline of from 10-30 mm. Hg. The lowest level is reached about the fourth hour of sleep; this level is maintained until a short time before awakening, when the pressure commences to rise. MacWilliam found that, if sleep was disturbed by exciting dreams, the blood pressure might be elevated well above the waking level of 125-130 mm. Hg. up to 180 or even 200 mm. Hg. The pulse rate was slowed by from 10-30 beats. The heart regulating mechanism was depressed. The respirations are slowed and are said to become more costal in character; they also tend to become irregular or periodic. Muscle tone is minimal; the kneejerk is abolished, and the positive sign of Babinski may be present. The thresholds for most somatic reflexes are definitely raised. Vasomotor reflexes are most active. In most animals, the righting reflexes are abolished. The pupils are usually constricted; the light reflexes are retained. The eyeballs are turned upwards. Urine volume is reduced, but the absolute excretion of urinary phosphates is increased, and the specific gravity of urine raised. The secretion of the sweat glands is considerably increased; it is said that the quantity of sweat secreted per hour in sleep equals that secreted during a corresponding period of strenuous muscular exercise. Gastric secretion is increased slightly in sleep. The contraction of the empty stomach continues and may be more vigorous than usual. The rate of digestion is about the same as during the waking state. Lacrimal and salivary secretion are reduced.

It may be of interest to give an account of the effects upon the nervous system of prolonged wakefulness. In Kleitman's human experiments, the subjects were kept awake for periods ranging from 60 to 114 hours. The knee jerk remained unaffected but this disappeared promptly when the subject went to sleep at the termination of the period of insomnia, and a positive Babinski was obtained. The latter was attributed to the establishment of a block in the cortico-spinal pathway. The pupillary responses remained brisk throughout the wakeful period. There seemed to be little impairment of the mental processes and the reaction to auditory and visual stimuli were as prompt as usual. The threshold for pain stimuli was definitely lowered,

whereas that for touch was unaltered. The power to maintain equilibrium, as judged by the ability to stand with the eyes closed, was grossly impaired. This defect was attributed to neuromuscular fatigue, and a consequent reduction in muscle tone rather than any impairment of labyrinthine function itself.

The period of wakefulness which would be lethal for human subjects is not definitely known. Changes in the nerve cells of the cortex, e.g. chromatolysis, and shrinkage of the cell bodies have been described as resulting from prolonged periods of enforced wakefulness.

Vascular Theory of Sleep

Howell enunciated the theory that the amount of blood flowing through the brain was the predisposing cause of sleep. In 1835, Durham showed in dogs with trephined windows in their skulls that there was a relative ischemia of the brain during sleep. This has been confirmed by some workers but not by others. Certain investigators have noticed that there is a greater volume of blood in the extremities during sleep than during wakefulness. It is well known that the blood pressure decreases somewhat during sleep. These facts do not necessarily prove that there is an ischemia of the brain but they do indicate that the velocity of the blood flow is decreased. Howell believes that in normal sleep the determining factor is a vasodilation of the cutaneous vessels caused by a fatigue of the vasomotor centre. This vasodilation is followed by a lessened blood flow through the brain.

Chemical Theories of Sleep

Several chemical theories of sleep have been proposed. One of the earliest of these was that fatigue products, especially lactic acid, formed in the tissues generally, acted by depressing the action of the cortex. Against this view is the well known fact that one need not be fatigued in order to sleep. Furthermore, the brain tissue actually derives energy from the oxidation of lactic acid. Piéron has attempted to prove that a toxin liberated by the organism during wakefulness acts on the cells of the central nervous system producing sleep. This substance he called *hypnotoxin*. To show the presence of hypnotoxin, he used dogs that had been deprived of sleep for long periods of time, and injected some of their blood, or cerebro-spinal fluid into normal dogs. The latter showed a tendency to go to sleep. The effect, however, is probably due not to the presence of a sleep-inducing substance in the "fatigued" cerebro-spinal fluid, but to a rise in intracranial pressure, since the injections of cerebro-spinal fluid from rested dogs had a depressing action, not considerably less than that of the fatigued fluid.

Theories Relating to the Hypothalamus

Several observations, both clinical and experimental, point to the existence of a sleep centre in the diencephalon. Hypersomnolence is a frequent accompaniment of tumours of the structures in the floor and walls of the third ventricle, or of inflammatory lesions involving the hypothalamic region. Hess claims to be able to cause sleep in animals by mild electrical stimulation of the diencephalon. Hess has also reported that ergotamine injected directly into the third ventricle induces sleep. Ergotamine paralyses the motor and secretory fibres of the sympathetic nervous system. Since the sympathetic and the parasympathetic centres are apparently situated in the hypothalamus, Hess argued that the drug, by suspending the activity of the sympathetic centre, causes a preponderance of parasympathetic effects. Sleep, he concluded, was a parasympathetic function. Hess also draws support for his theory from certain manifestations of parasympathetic activity, namely pupillary constriction, bradycardia, and vasodilation which accompany sleep. Though this observer's idea that sleep is a parasympathetic function requires further experimental support before it can be accepted, the evidence for the participation of the hypothalamus in the sleep mechanism is very strong.

Pavlov's Theory of Inhibition

While studying the conditioned reflex and how it may be inhibited by other closely allied conditioned reflexes, Pavlov turned his attention to the cause of sleep. He stated that sleep is due to an inhibitory process. A short summary of his explanation is as follows: the day's activity leads to an overstimulation and fatigue of many cortical points, which then become centres of inhibition. The inhibitory process then spreads from these foci over the cortex and lower cerebral centres, producing a condition of nearly complete cerebral inhibition followed by sleep.

Kleitman's Evolutionary Theory of Sleep

Like the old "hen and egg" question, is it not just as correct to say that a person felt an irresistible desire to sleep, as to say that it was utterly impossible for him to remain awake? Superficially the two expressions would seem to be equivalent, but their implications are entirely different. The first, implies an *active onset of sleep*, the other a *cessation of an active condition of wakefulness*. Pertinent to the adult, either view is acceptable but to the almost continued sleep of the newborn, it seems easier to account for it as an inability to maintain active wakefulness, than as a dominant state of sleep, unless one takes the Aristotelian concept of the larger relative size of the head to the body as an explanation. Sleep and wakefulness is a cyclical process, varying from the depth of dreamless slumber to the height of pursuit activity. A cycle varies in amplitude and rhythm, both of these variables being subject to phylogenetic and ontogenetic development. With these fundamental views, Kleitman postulated the evolutionary theory. The author states "wakefulness, of necessity, is a subcortical, probably hypothalamic function, whereas the supplementary wakefulness of choice, as well as the diurnal sleep-wakefulness is a cortical function".

The sleep of lower animals and of the very young of higher animals represents, excluding stuporous conditions, (anaesthesia, coma, and hibernation), the lowest level of sensory-motor activity that brings the organism into relation with its environment. The vegetative processes, however, which characterize the state of sleep continue in the absence of mere "animalistic" activity. An animal, completely isolated from all exteroceptive stimuli, will be eventually aroused by the high rate of frequency that its interoceptive and proprioceptive impulses acquire. Proprioceptive impulses of positions of joints and tendons, impulses from distended anus and bladder, hunger and thirst impulses, all gain in frequency and soon result in a wakefulness of necessity. This is the differentiation criterion between animals and plants (plants having only vegetative processes).

Wakefulness of necessity represents a disturbance of the peaceful primitive sleep and is not a pleasurable state, but resembles the "sham rage" of Bard's hypothalamic preparations. It manifests itself, mostly as a polyphasic type of existence, but gradations exist between it and the wakefulness of choice which is dependent upon the greater part played by the cerebral cortex in the animal's activity during the course of its phylogenetic and ontogenetic development. It is important to point out that wakefulness of necessity involves no pleasure, but is forced upon the animal like Ranson's concept of "the hypothalamic drive".

Wakefulness of choice is the prolongation and modification of the wakefulness of necessity, leading to a prolongation and modification of the sleep phase of the sleep-wakefulness cycle, resulting in an increased length of the sleep phase. It develops gradually as the cortex and distance receptors develop, and the "spontaneous" activity of the organism increases. What ends the wakefulness of choice? (1) Neuromuscular and also, perhaps, sensory fatigue resulting merely from a maintenance of the wakefulness of choice will lead to a functional deafferentation of the cortex, raising the threshold of irritability and blocking the efferent side; this abolishes the state of continual excitation of the sleep centre, and

the return to the condition of sleep follows. (2) No evidence exists that the fatigue ability of the "sleep centre" is involved. (3) Prolonged wakefulness results in the deterioration of the cortical function of analysis and integration. Wakefulness of choice or synonymously the continuous activity of the highest cortical levels (youngest phylogenetically and ontogenetically) is maintained at the price of the continuation of muscular activity which keeps the cortical centres and the subcortical "sleep centre" in a state of excitation.

Closely bound up with the wakefulness of choice is the adaptation of the sleep-wakefulness cycle to the diurnal alternation of day and night. In the evolution of the sleep-wakefulness rhythm, there has been not only a consolidation of several periods of sleep and wakefulness per 24 hours, into one period of each, but also an increase in the total duration of the wakefulness phase, from 2 hours in the infant to 17 hours in the adult (increase of from 8-70% of the diurnal period of time). Kleitman claims that this period of wakefulness is unequalled in any other animal below man, and that it varies for different periods in an individual and for different people.

By the evolutionary theory, the primitive alternation of sleep and wakefulness of necessity needs no intact subcortical mechanism, aside from the intact subcortical centre itself. Interoceptive and proprioceptive impulses merely gain in frequency to activate the sleep centre, and disrupt the vegetative existence of primitive sleep. A special mechanism is necessary for the diurnal alternation of sleep and wakefulness of choice. This mechanism is provided by the establishment and maintenance of a diurnal periodicity of body temperature, metabolic rate, muscle tones, and cortical activity manifested by the diurnal performance curve of man. Of these periodicities, the temperature rhythm is not primary but is dependent on the diurnal variation in muscle tone. The increase in muscle tone leads to a rise in body temperature which causes greater cortical activity, which, in turn, causes greater muscle tone and a further temperature increase, etc. This cycle maintains the wakefulness of choice. Prolonged wakefulness of choice, over a period of 72 hours, causes neuromuscular and cortical fatigue which breaks and reverses the cycle. The sleep centre is inactivated and a return to the state of sleep achieved. The 24 hour duration of the cycle is an adaptation due to social conditioning, training, and education, rather than Volker's vague cosmic principle. The temperature periodicity is not the only one reflected subcortically but other vegetative endocrine and cortical activities are also involved. The temperature one has been chosen because its close relation to muscle tone has been established.

Kleitman concludes: "cortical dominance, being the principle feature in the phylogenetic and ontogenetic development of the vertebrate nervous system, is also the determining factor in prolonging the time allotted to the wakefulness phase and in adapting the rhythm to the diurnal alternation of day and night".

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Abstracts

CRAWFORD B. SHIER, Editor

Contributors A. M. J. Crossland, R. C. Smith, G. E. Wodehouse, G. R. Walker, J. G. Watt

OBSERVATIONS ON HUMAN BLOOD STORED AT 4°-6° C.

W. P. BELK; N. W. HENRY; F. ROSENSTEIN
American Journal of Med. Sc., Nov. 1939

These recent studies indicate that the enthusiasm for this innovation in transfusion methods is not entirely justified. Observations on ten samples of human blood kept at 4° to 6° C. over a period of twenty days are reported.

The most important changes observed in these samples of stored blood were an increase in the fragility of the erythrocytes, disintegration of the granulocytes, and impairment of the properties of coagulation, all progressive. The fall in CO_2 c.p. of the blood and in blood sugar, although marked, are probably not important items in a transfusion medium. These changes, with the exception of Quick's prothrombin time, began at once and were well advanced by the fifth day. The alterations in all the bloods were similar in character and magnitude. Thus it is apparent that stored blood should not be used in the treatment of agranulocytic angina, if the expectation is to restore granulocytes. Whether the disintegration products of these cells could still serve as a stimulant to the manufacture of new granulocytes is, of course, a speculation. The same restriction, obviously, should apply to purpura haemorrhagica and to haemophilia, because of the diminution of platelets and their product, to vitamin K deficiency, and probably, to all haemorrhagic diatheses.

It would seem, from the results of this and other studies, that refrigerated blood should be used within a few days of collection and that the arbitrary limit of fourteen days allowed by some is much too long. Since a rapid turnover and prompt use is possible only in institutions performing large numbers of transfusions, 100 or more per month, a blood bank is apparently ill-advised for small hospitals.

C. B. S.

EYE SIGNS IN INTRACRANIAL DISEASE

R. J. P. McCULLOCH, Toronto
Canadian Medical Association Journal 42,236, 1940

In the routine examination of the eyes the following items have special significance in regard to neurological disease.

Corneal anaesthesia is an early sign of damage to the fibres of the fifth nerve by inflammation of the Gasserian ganglion or by involvement of the fibres by an acoustic neuroma.

Unilateral paralysis of a sixth nerve has no localizing value but a bilateral paralysis usually indicates a lesion in the medulla. A sudden third nerve paralysis points to a subarachnoid haemorrhage. A slowly developing third nerve paralysis combined with choked discs suggests a basal tumor, usually anterior to the carotids.

If the components of nystagmus are equally rapid, it is probably congenital in origin, or due to insular sclerosis. Nystagmus associated with other signs of brain tumor usually localizes the lesion in the cerebellum. Vertical nystagmus is associated with irritative lesions of the corpora quadrigemina or tumors of the pineal body.

A tumor in the occipital lobe usually produces an homonymous hemianopia;

if it occupies a part of the temporal lobe an homonymous quadrantic notch may result. Tumors involving the optic tracts or radiations, between the optic chiasma and the occipital lobes, will produce field defects according to their positions. Tumors of the pituitary body typically produce a bitemporal hemianopia. In cerebral haemorrhage a field defect is often present, and the patient is aware of this usually.

Papilloedema is the outstanding ocular sign of brain tumor. It is most constantly present in tumors involving the cerebellum, fourth ventricle, temperosphenoidal lobe or the corpora quadrigemina. It is present in half the subcortical cerebral tumors, and occurs only late in the course of frontal lobe tumors. Optic atrophy associated with field defects points to a tumor in the pituitary region.

Finally, ophthalmic findings are of considerable value in estimating the progress of intracranial disease and in evaluating the effects of treatment.

R. C. S.

ACUTE HAEMATOGENOUS OSTEOMYELITIS

R. HALL McCOY and D. E. ROSS, Montreal
Canadian Medical Association Journal
Feb. 1940

This article presents a group of cases of acute haematogenous osteomyelitis, and an attempt is made to evaluate the various forms of treatment used.

Surgical drainage is essential in the treatment of acute haematogenous osteomyelitis of the long bones. This is best accomplished by the Orr method, which consists of surgical drainage of the lesion followed by placing of the part at rest by means of plaster casts. Results show that cases treated this way have fewer recurrences of the disease, and that, once healed, the wound has shown no tendency to sinus formation. Surgical drainage is not contraindicated in cases of severe septicaemia accompanying acute haematogenous osteomyelitis.

The mortality rate is higher in those cases with positive blood culture showing Staph. aureus (87%) than in those with streptococcal septicaemia (33⅓%). In those cases with staphylococcal septicaemia, all recovered if the blood showed less than 8 to 10 colonies per c.c. Only one case out of eight recovered when there were more than 10 colonies per c.c.

Repeated transfusions and intravenous administration of fluids are of value, especially in the streptococcal type of septicaemia.

A method of administering staphylococcal antitoxin is outlined but it is found that the staphylococcal antitoxin is not of value in combating the septicaemia associated with osteomyelitis as regards the prevention of the formation of secondary abscesses and the final fatal outcome. In some of the cases it seems to cause a temporary improvement in general appearance and to reduce the number of colonies in the blood stream. The intravenous continuous drip method of administration is the procedure of choice.

The authors state that there will be no reduction in the mortality rate from acute haematogenous osteomyelitis until a more effective treatment for the septicaemia is available.

J. G. W.

POST APPENDICEAL ABSCESS IN THE RETROVESICAL POUCH: TRANSRECTAL DRAINAGE

C. FREMONT VALE
Am. J. Surg., March 1940

Abscess in the rectovesical pouch following removal of the acute or early perforated appendix is one complication which has not received the emphasis it deserves, either as to diagnosis or treatment.

It is very often missed in diagnosis simply because it is often not even kept in mind. Its presence may be indicated by irregular fever, malaise, loss of appetite and high leucocytosis. This often appears from four to seven days

post-operative or the convalescence may start off stormy and remain so. There also may be frequency of stool and a feeling of fulness as well. If the abscess is in contact with the bladder it will cause bladder symptoms. The passage of large amounts of almost pure mucus per rectum is very significant. There is also an associated degree of intestinal distention. Relaxation of the rectal sphincter is an important sign. Just above the prostate a mass can be felt by the examining finger usually soft and cystic or less commonly indurated. Moderate tenderness is felt.

Disagreement is mainly encountered on the question of drainage. The many objections to a simple rectal drainage by the technique described are all answered in an amazingly logical way. This method of treatment of this troublesome complication appears to me to be a very acceptable way of treatment.

A. M. J. C.

Book Review

"TEXTBOOK OF MEDICAL TREATMENT"

BY VARIOUS AUTHORS

Edited by: D. M. DUNLOP, B.A. (Oxon.), M.D., F.R.C.P. (Edin.)

Professor of Therapeutics and Clinical Medicine, University of Edinburgh

The Macmillan Co. of Canada, Ltd., Toronto, 1939. 1,124 pages; price $7.50

This book is a compilation of medical treatment by some twenty-five of the leading internists and others who are associated with medical teaching and practice in Scottish Universities. Its primary purpose as stated by the distinguished editors is "to fill the therapeutic gap left by the majority of textbooks on general medicine in which, owing to the exigencies of space, the section devoted to treatment is often inadequate".

This text is obviously based on the wide therapeutic experience of the authors, and is not a miniature encyclopedia of out-dated medical procedures. One is impressed by the evident intent of the writers to assist the general practitioner in the solution of his treatment problems. Methods are not merely suggested or implied, but outlined in every essential detail. Choice of method, however, is not sacrificed on behalf of specificity.

A brief but complete summary of the etiology and symptomatology prefaces the treatment recommended for each disease. This minimizes the necessity for frequent reference to medical texts.

While the subdivisions of the text vary somewhat from that of other works the variation is designed to aid the reader, e.g., separate sections deal with: Septicaemia and Erysipelas, Diseases of the Blood Vessels of the Limbs, and Industrial Diseases. A section of particular value is that devoted to Psychotherapy in General Practice.

The Textbook of Medical Treatment is concise, modern and like most textbooks of British origin, is distinctly readable. It should prove to be of equal value to both student and practitioner alike.

W. B. PHAIR

Feature Section

F. L. LAWSON, Editor

A LONDON HOSPITAL IN WARTIME

By ANTHONY S. TILL, M.B., F.R.C.S. Eng.
Ministry of Health Emergency Hospital, Aylesbury

On my return to London early last August from the peaceful atmosphere of Canada, I was to find the Middlesex Hospital a very different place from the one I had left nine months before. The general feeling had entirely altered from the previous September, everyone seemed immune to the recurrent crises, our state of preparedness was far advanced to that of a year ago, and the only worry was that the present threat of aggression might go unchallenged. The days passed by and the news became blacker; then the doctors who were already on the reserve or in the Territorials started to be called up, and arrangements were finally completed for deploying the hospital personnel throughout the Sector for which the Middlesex Hospital was responsible.

Looking back on the first few weeks of the war it now seems somewhat of an anti-climax, since the sky has not yet rained bombs nor the gutters run with blood, but at the time one could only fear the worst and make arrangements accordingly. It is a curious spectacle to see a great hospital, on whose activities the sun has not set for some two hundred years, gradually slowing up; yet the same thing was happening in all the other big hospitals in central London. Admissions ceased except for acute emergencies, cases for elective surgery were discharged, and those still in the wards were classified so that when the news came that war was inevitable they could be discharged home or evacuated to outlying hospitals. Outpatient clinics were poorly attended, and indeed no one had much enthusiasm to put cases on a waiting list that might never materialise. Operating lists became smaller and smaller as one weighed up the chances of disease against destruction from the air: patients with malignant disease were discharged whether they were in the middle of treatment or not treated at all, and it was with melancholy resignation that one had to turn these unfortunate people away. The stores of radium were sunk in the ground for safe keeping.

Although the work of the medical staff decreased considerably there was much to be done sandbagging, boarding up windows, and constructing new operating rooms. Our main theatres are on the top floor, and the danger of their position and the impossibility of blacking-out the enormous windows made it necessary to construct emergency theatres elsewhere and in the basement. The spacious entrance hall of the hospital, converted into a receiving room, now resembled the Black Hole of Calcutta: trestles, stretchers, and tables of dressings, instruments and morphine were put ready, and a decontamination squad was trained to deal with gas casualities. All outside entrances of the hospital and the entrance courtyard were boarded up, not so much as a protection against missiles as against the surrounding populace, largely of foreign extraction, who are apt to think that a hospital is a convenient shelter during air raids.

The day before war was declared, the greater number of patients were evacuated in converted Green Line buses and special trains to other hospitals in safe reception areas, a big undertaking which went off without a hitch. Only about forty patients were left at the Middlesex; Guy's Hospital boasted only twenty-seven. A good idea of what this entails can be envisaged

if you imagine the wards of the T.G.H. quiet and empty save for a few cases too ill to move, the corridors and hall filled with all manner of cases on stretchers, their belongings beside them, waiting to be transferred by ambulance or special trains to such towns as Hamilton, Kitchener or Guelph. If it is hard to picture this scene in the well-ordered hospitals of Toronto it was almost as difficult in London to realize what was really going on, for from outward appearances London looked very much as usual, except for the barrage balloons which floated like silver sausages in the sky, and for the trenches which had been dug in the parks and squares. However, there was not much time for contemplation, for on the outbreak of war we had to report at various hospitals throughout the Sector.

The Ministry of Health Emergency Service has divided London into ten areas, each one a Sector, at the apex of which one of the voluntary teaching hospitals is located as a casualty clearing station. In the outlying districts of the Sectors, hospitals have been partly or completely taken over, and new hospitals have been built to act as bases to which patients are evacuated as soon as possible. Each Sector controls about half a dozen hospitals, and these are staffed partly from the teaching hospitals and partly by their usual medical officers.

On the outbreak of war, many little towns around London may have been expecting invasion by enemy bombers, but were horrified instead to find hordes of doctors, nurses and medical students, descending upon them to be billeted in their houses and fed at extraordinarily inconvenient hours. County Hospitals, Poor Law Institutes, Cottage Hospitals, Asylums and Sanatoria, suddenly found their staffs vastly augmented, and rows of government beds appeared in their wards. Batches of students were detailed off to each hospital to help as orderlies and occupy their spare time in sandbagging the buildings. However, it is an ill wind that blows nobody any good; the sudden and violent contact with which we were thrown into other peoples lives created many difficulties, but these for the most part were overcome by the kindness and co-operation of our new colleagues, and there is no doubt that everyone profited by the enforced collaboration of many branches of medicine, and by the necessity for improvisation. It is amazing what one can do with six artery forceps and a retractor when one is put to it.

The system of teaching reverted for a time to that practised three hundred years ago at the Universities, when tutor and student lived in the same room. Now once again they occupied the same billet and fed in the same common mess. Clinical teaching soon got under way again in many of the hospitals, where the clinical material was often varied and of rather a different nature to what we usually saw in the wards of London Hospitals, and the students had the advantage of being in unusually close contact with their chief. Although the medical schools are now scattered in small units throughout the Sectors, they have not escaped the usual exams, which have been held in Bristol and Manchester instead of London.

The town in which we were stationed increased its normal population of eighteen thousand by one-third, and this influx coupled with the black-out produced more broken skulls and fractured legs than I have seen for a long time. Before we grew accustomed to driving without head lamps and to the total absence of all street lighting, hardly a night passed without serious accidents being brought in.

Some of us were not so lucky. Several of the hospitals existed on paper only, or consisted of marquee tents which had a distressing habit of collapsing or blowing away. One of our base hospitals was a commandeered Poor Law Institute, without blankets, thermometers, equipment or instruments. Staff and students lived in prison-like cells, previously occupied by tramps, indigents and imbeciles. Three of the senior members of the Middlesex staff were reduced to sleeping together in an attic at a nearby house. Food appeared from an improvised kitchen in what was previously the "Male Ablution Room". The unusual clemency

of the English summer was a god-send during the first few weeks of the war, when there was so much work to be done outside.

All this is now a thing of the past, however; the potato patches of the workhouse garden have been dug up, and long wards now take their place. Within six weeks of the outbreak of war patients were being admitted, and there are now one hundred and fifty occupied beds and three hundred more available, two operating rooms, X-ray and pathological departments capable of dealing with practically every type of medicine and surgery. Staffed entirely from our parent hospital, the Middlesex, this Sector hospital is as nearly as possible a miniature edition of it, and not a bad one at that.

That is how we started, but the absence of air raid casualities has caused a good deal of modification of the original plans. Many of the honorary staff of the teaching hospitals are now only on part time service in the Sector hospitals and can give some time to their private patients, who at the beginning of the war found consultants hard to come by. The London hospitals are now running with about half their normal complement of beds, the other half being empty and reserved for possible air raid casualties, but they look dreary enough now when compared with their teeming humanity of normal times. Out-patient clinics have re-opened, and from these, patients are sent down to the base hospitals in the reception areas for treatment. Many of the medical students are back in London after several months in the country which were not altogether unenjoyable, while others have replaced them to take their medical or surgical appointments in these smaller Sector hospitals.

This is a brief description of the evacuation of the London hospitals at the beginning of the war, and something of the building up of the Emergency Medical Service; how and when the scheme will come into full use, Time alone will show.

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C.A.M.S.I. Section

THE CANADIAN ASSOCIATION OF MEDICAL STUDENTS AND INTERNS

To those who formed the C.A.M.S.I. the need for a national organization of medical students and interns was at that time apparent and now they take it for granted that such a need exists. But since this is the first widely distributed report of a C.A.M.S.I. conference it may be in order to state briefly the aims of the C.A.M.S.I., its policies in pursuing those aims, what success may have been achieved to date, and what the general direction of future objectives will take for the benefit of those who know little or nothing about the C.A.M.S.I. and as a guide to those actively participating in its work.

The first and the most important policy to which our success may be attributed, and from which the C.A.M.S.I. must not depart in the future, is that the C.A.M.S.I. deals only with problems concerning medical students and interns as such, problems which are indisputably the business of medical students and interns only. While recognizing that many other problems exist which concern medical students and interns as part of the general public, those problems are left to the attention of other, more appropriate institutions. Thus the C.A.M.S.I. takes no stand on general questions of policies, international affairs and economics and is not a debating forum for such topics and so differs radically from the Association of Medical Students in the United States.

The second policy and no less important than the first is that the C.A.M.S.I. deals only with problems concerning medical students and interns on which something constructive and practical can be done to solve those problems

Why was it necessary to form a national organization with annual conventions to which medical students are sent from far away universities at great expense? One reason for this was that the very pressing problems facing medical students and interns could only be solved by the cooperation of our various medical schools. For example, the formation of a Canadian Intern Board. Another reason was the unquestionable benefit that could be derived from the interchange of ideas at such conferences. I need only mention the fact that since the formation of the C.A.M.S.I., and as a result of its existence, measures for early detection of tuberculosis have been introduced in six of our medical schools which did not have this before and that similar progress is being made, although more slowly, in the establishment of comprehensive student health services. These are concrete results of cooperation and interchange of ideas accomplished in the three years of our existence. Other instances can be cited and other and more important problems have still to be solved when the C.A.M.S.I. has attained sufficient age, prestige and experience to deal with them. Such problems are those presented by intern health, intern education and student health, in brief problems which fall within the scope of the C.A.M.S.I. as defined by the above policies.

While the aims of the C.A.M.S.I. are essentially progressive, its methods in pursuing those aims are conservative. The policy of careful preparatory study of the problem at hand from the proper sources is apparent in our resolutions to date and the right word spoken to the right person or persons at the right time has so far been the method whereby our accomplishments to date have been attained.

The immediate problems of the C.A.M.S.I. can be studied in the reports elsewhere in the journal. I should however like to point out that the most important of these aims is that of the universal adoption of adequate methods for the prevention of and early detection of tuberculosis among medical students and interns. When that has been attained the problems of intern education and training will probably constitute the most important and the most difficult of C.A.M.S.I. problems.

THE KINGSTON CONVENTION

The 3rd annual convention of the C.A.M.S.I. was held at Queen's University, Kingston, Ontario, on March 2-3, 1940. Toronto had played hosts for the two previous conventions, and they must be given credit for their untiring efforts in the formation of this organization. In addition to these three official annual conventions there was a semi-official convention held at Quebec last fall which a good number of representatives attended.

Surely these activities are worthwhile and to the advantage of every student and intern. 100% support of its organization is what C.A.M.S.I. aims at, for only with that support can it accomplish the best results. It is of particular importance that graduating medical students retain their contacts with C.A.M.S.I. and report on deficiencies as they find them in their respective hospitals for C.A.M.S.I. is an organization of students *and interns* and the interns in turn will benefit from their support of C.A.M.S.I.

NATIONAL EXECUTIVE

Honorary President	Banting, Sir Frederick
President	Benson, C. K.
Vice-President	Megill, A. H.
Secretary-Treasurer	Kelly, H. G.

NATIONAL COMMITTEE

Official Delegates at the Third Annual Convention held in Kingston, Ontario, March 2-3, 1940

School	*Name*	*Address*
Toronto University	Wm. K. Kerr (Can. Int. Bd.) Jack Denne Paul McGoey (Can. Int. Bd.) Cliff Healy	Room 107, Anatomy Building, U. of Toronto, Toronto, Ontario
McGill University	Joseph Wener Donald Lloyd-Smith Guy Joron	Medical Building, McGill University, Montreal, P.Q.
Queen's University	Jack Latiner Cliff Scharfe Wilson Ford	Medical Library, Queen's University, Kingston, Ontario
Western University	Ray Stubbing Ken Ingham Bill Lovegrore	Medical College (Western U.) London, Ontario
University of Manitoba	Jack Silversides John Gemmel	Man. Medical School, Winnipeg, Manitoba
University of Alberta	Dr. Ralph Berry	Western Hospital, Toronto, Ontario
University of Montreal	R. Robitaille Guy Cousineau M. Bourque	c/o Conference Laennec, Faculty of Medicine, U. of Montreal, Montreal, Quebec.
University of Laval	Maurice Demay Jacques Dubé Marc Papineau	Association Générale Des Etudiants de Laval 29, Rue Couillard Québec, (Canada)

SUMMARY OF REPORTS PRESENTED

1. Organization

The Canadian Association of Medical Students and Interns was formed at a conference of student delegates from McGill, Queen's, Toronto and Western Medical Schools held in Toronto, March 13, 1938.

At that time the outline of the purpose, organization and functions of the C.A.M.S.I. were drafted and a National Executive in Toronto appointed.

Since then communication has been established with all Canadian Medical Schools. At the present conference, held in Kingston, Ontario, March 2-3, 1940, all graduating medical schools were represented by delegates.

The fine details of the organization are to be found in the constitution of the C.A.M.S.I. drafted at the conference.

The activities of the National organization have been presented under separate topics such as Tuberculosis, Canadian Intern Board, etc.

2. Financial Report of National Executive

STATEMENT, FEB. 4, 1939—MARCH 30, 1940

Receipts

Balance, Feb. 4, 1939	$ 0.84	
Membership fees	42.70	
Loan by University of Toronto	10.00	
Can. Int. Bd. refund	31.60	
		$85.14

Disbursements

Stamps, typing, service charges	$ 9.28	
Mimeographing	38.00	
Refund of loan to U. of Toronto	10.00	
		$57.28

Balance

Transferred to Executive of 1939-40	27.86	
	$85.14	$85.14

3. Financial Report of Canadian Intern Board

Paid—

(i) Telegrams	$10.80
(ii) Long distance calls	8.53
(iii) Refunds	4.00
(iv) National Executive C.A.M.S.I.—Promotion of Can. Intern Board	31.60
(v) University of Toronto Press—Forms and stationery	50.00
	$104.95

Unpaid—

University of Toronto Press	24.00

Cash on Hand, March 1, 1940—		
Revenue	$131.00	
Paid items	104.95	
Cash on hand		$26.05

4. Book Co-operations a study by Western U.;

In view of the rather exorbitant prices some medical schools are obliged to pay for their books and instruments, Western U. present their scheme which is practicable, financially sound, and results in great saving over a period of six years. The Hippocratic Society controls a combined book store and tuck shop operated by a few men who are paid a salary. Proceeds from the selling of tuck and other accessories finance the operation of the store and students are thus able to receive their books at reduced prices. Although the books and instruments are sold at prevailing retail prices a dividend is paid later in the term amounting to 10% on text books and up to 20% on instruments. The principle of co-operation in the purchasing of supplies by the students is a sound one and provides a bit of extra-curricular education in economic and business principles.

5. Publications

Our organization is still seeking for some permanent medium of publication of its activities and aims, but any such scheme must be one within the range of our financial strength. While we are still working on this project through the efforts of McGill U. and U. of Laval, the U. of Toronto has very generously met the issue for this session just completed by offering to print our activities for the year in a special issue of its own undergraduate Journal. But it would be too much to impose such a permanent financial burden of this nature on one school. It is generally agreed that the pamphlet should be isssued in its infancy as a pre and post convention issue with the expenses largely met by advertising. Our associates at McGill and Laval are now working on the most practical manner in which a publication should be issued and whether its nature should be

(a) Strictly medical, containing articles presented by the students in their respective universities, or reports compiled especially for the journal.

(b) Like the Journal of the A.M.S. with articles of general interest and other topics related to medicine.

(c) A publication containing exclusively reports of the C.A.M.S.I. activities.

6. Student Health

(a) This is a problem which needs much improvement. It concerns each individual medical school and the problems vary with the locality. A fine report was received from Manitoba and will be printed if possible.

(b) Tuberculosis.

Surveys of the incidence of T.B. among medical students have been made both in McGill and Toronto. These have been sponsored by C.A.M.S.I. Skin tests and X-rays are available for Montreal and Laval students. An excellent report compiled at U. of Montreal was filed with a Quebec government committee. A report was also received from Western U., summarizing results of skin tests and fleuroscopic examinations.

7. Intern Maintenance

This is a problem that concerns every individual graduating from medical school and yet it is a difficult problem to solve. In the West most graduates have already served 1 year of undergraduate internship and so when they do graduate they receive an adequate intern maintenance allowance. In the French Canadian Schools the situation is about the same. McGill too are not so much concerned for under their present arrangement their final year is an intern year—and therefore the question of allowance does not concern them. But in Ontario that a graduate should intern with insufficient funds for his own maintenance seems unreasonable and steps are being taken to rectify it.

8. Intern Welfare

Investigation has been started on this question by circulating of questionnaires. While circulation is still incomplete, and replies are flavoured with too many personal touches certain

conclusions have so far been drawn among which are the protests that on the whole there is too much laboratory work, lack of proper training in all services, etc. It is hoped that the society will be able eventually to get enough information that it may supply prospective interns with complete information concerning the internships and residencies available in Canada. It is thus urged that students, once they graduate, do not forget the C.A.M.S.I. but keep contact with it, for the C.A.M.S.I. depends on the intern for information concerning his hospital and in turn the intern stands to benefit by what ever progressive legislation the C.A.M.S.I. is able to establish. Therefore why not form a regional committee in your hospital and report to the C.A.M.S.I. what you lack and what you think should be done to rectify this.

9. Speakers Bureau

At McGill the C.A.M.S.I. has fostered a students speakers bureau for the purpose of

(a) Allowing medical students to meet lay people in small groups and to learn to appreciate the problems facing these people.

(b) Imparting medical information on various topics of public health and preventive medicine. The bureau is endeavouring to become more widely known and to be utilized for promoting health consciousness in the general public.

10. Canadian Intern Board

Mr. P. F. McGoey, first president of the C.A.M.S.I., conceived the idea that interns could be allotted to hospitals by a central board which would dovetail the preferences of both interns and hospitals. The result would be that each applicant would receive the best hospital which would appoint him and that each hospital would receive the best applicants who would accept their appointments.

To this end Mr. W. K. Kerr, then Secretary-Treasurer of the National Executive, drafted the organization of such a board, formulating its mode of operation and outlined the steps whereby the board could be put into effect. At the second annual conference of the C.A.M.S.I. in Toronto, March, 1939, the plan was adopted unanimously and Mr. McGoey and Mr. Kerr were delegated to proceed with its execution.

With the first year of operation it soon became apparent that insofar as the students concerned the Board is an unqualified success and from the point of view of the hospitals there has been a considerable reduction in the number of maladjustments from that of previous years. The few that did arise could in every instance be traced to those few students from whom the Board had received no information as to their preference of hospitals. In the future hospitals will be supplied with complete lists of students who have submitted their preference list to the Board so that they may protect themselves against the uncertainty of appointing students whose preference of hospitals is unknown.

It was brought to our attention that several hospitals failed to notify the students of their appointments for some time, leaving the latter in unnecessary uncertainty and suspense as to their appointments. This will next year be rectified by announcing the appointments to the students directly.

In the constitution of the Board, which was adopted at the Kingston conference by the C.A.M.S.I., and which now awaits adoption by the Canadian Hospital Council, it will be noticed that provision has been made for representatives from each medical school who may at the time observe the allotment of interns to hospitals.

In conclusion the present Executive of the Board wishes to express their appreciation to the hospital authorities and to the students whose cooperation has made this trial year a success, and hope that with past experience an even more satisfactory service can be rendered both hospitals and students.

PROCEDURE FOR THE APPOINTMENT OF INTERNS

1. Each medical student will apply for an internship to the administrator or the intern committee of the hospital in the same manner as at present.

It is suggested that all applications should be made to the hospitals before November 1st of each year.

2. The medical student will enter on a Form A (supplied by the Canadian Intern Board) the names of the hospitals to which he has applied for an internship in the order of his preference and send the form to the Canadian Intern Board before November 1st of each year.

3. The hospital administrator or Intern Committee will rank the applicants in the following two groups, from an investigation of the applications, personal interviews, hospital examinations, letters of recommendation or any other data that may be available:

Group 1—Those that the hospital definitely desires as interns;

Group 2—Those that the hospital will appoint should any applicants in Group 1 be eliminated, i.e. alternates or second choices, listed in order of preference.

The hospital will enter the names of the applicants in these two groups on Form B (to be supplied by the Canadian Intern Board) and send the form to this Board on or before December 1st of each year.

4. The Canadian Intern Board will examine Forms A and B, endorse each hospital list of applicants in Group 1, if no other hospital has placed the same applicant in Group 1. In the case of those applicants which have been placed in Group 1 by two or more hospitals, the Board will endorse the hospital list in which the applicant has placed the hospital highest in order of his preference on Form A, and will delete his name from all other hospital lists, thus creating vacancies for alternates in these hospitals.

The Board will then fill these vacancies from those applicants who have been placed in Group 2 on Form B submitted by the respective hospitals, and the same method followed as above. By this arrangement the hospitals will still control the filling of any gaps on their selected list of interns.

The Board will continue this process of dovetailing the hospitals' choice of applicants and the students' choice of hospitals until the lists of choice have been exhausted.

The Board will send to each hospital the list of interns as it has been revised by the above procedure by December 31st of each year, and the hospital will notify the applicants of their appointment as intern as soon as possible. This can be done only if the hospitals cooperate by making prompt reply. On the receipt of his notification of appointment, each applicant must notify the hospital of his acceptance immediately.

It is quite likely that vacancies in some of the hospitals will not be filled and that some of the students may not be placed. In order to bring these together, the Board will send to those hospitals with unfilled positions the names of the students without appointments and will send those students who are not appointed to any of the hospitals, a list of hospitals in which vacancies are still present. Students may then make application to these hospitals and the hospitals could communicate directly with the students.

Result

By this scheme, each hospital would secure the interns considered by it most desirable, and each medical student would receive the best appointment open to him in accordance with his expressed preference.

Policy

The Canadian Intern Board does not guarantee that each hospital will obtain their full quota of interns, nor does it guarantee that each applicant will receive an internship.

In the operation of this plan the Board will adhere rigidly to the rules of procedure as agreed upon by the hospitals and the medical students; thus there will be no infringement on the rights of either party, and there can be no cause for dispute.

Internships affected by the Plan

Undergraduate internships which are arranged by the universities, senior internships, residences, research positions and similar appointments are not included in this plan, as appointments to these do not present the same problems as do the appointments of graduates to junior internships.

OFFICERS OF THE CANADIAN INTERN BOARD, 1940-41

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Honorary Treasurer ..... F. A. Logan, M.B.
Chairman ..... R. A. Seymour, M.D., Canadian Hospital Council
Secretary ..... C. J. Healy, Canadian Association of Medical Students and Interns

ADVISORY COMMITTEE OF THE CANADIAN INTERN BOARD

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Agnew, G. H., M.D., F.A.C.H.A. ..... Toronto
Boucher, D. W., M.D., C.M., F.R.C.S. (Edin.) ..... Kingston
Campbell, F. J. H., B.A., M.D., M.R.C.P., F.R.C.P.(C) ..... London
Kerr, W. K., M.D. ..... Toronto
Logan, F. A., M.B. ..... Toronto
Mathers, A. T., M.D., C.M. (Man.), F.R.C.P.(C) ..... Winnipeg
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Pope, Egerton L., B.A. (Queens) M.D., C.M.(McGill) F.R.C.P. (London) F.R.C.P. (C) Edmonton
Ryerson, E. S., M.D., C.M. ..... Toronto
Vezina, Charles, M.D., F.R.C.S.(C), membre de A.C.F. ..... Quebec

RESOLUTIONS PASSED

1. National Health Services

Whereas it is in the best interest of medical students that they be familiar with conditions under which they will practise and whereas the Division on Public Health and Medical Services of the National Committee for Mental Hygiene (Canada) has recently presented a nation-wide survey of health conditions which has shown the present provision of medical services to be insufficient to meet the needs of the whole of Canada.

Therefore be it resolved that C.A.M.S.I. cooperate with other Canadian organizations such as the Canadian Public Health Association, the National Committee on Mental Hygiene, and the Canadian Medical Association and others in such conditions.

That the local C.A.M.S.I. Committees provide for study groups and for lecture series to acquaint their members with recent trends in this field.

That the National Executive encourage local Groups in such activities.

2. Dominion Council Fees

Whereas the present fee for the Dominion Council Examination appears to be larger than necessary to meet the expenses of the Dominion Council; and whereas the expenses of graduating students have steadily increased in several of the universities.

Be it resolved that the National Committee of the C.A.M.S.I. at its convention at Queen's March 3, 1940, request the Dominion Council to reduce the examination fee as far as possible.

3. Dominion Council Examinations

Whereas the Dominion Council examinations appear to duplicate final year Examinations of the various Canadian Medical Schools to a large extent. Be it resolved that the National Committee at its convention at Queen's, 1940, request that the Dominion Council consider the possibility of collaflorating with the Medical Faculties and together conduct one common set of Examinations which will satisfy the Dominion Council and the Medical Faculties.

4. Intern Welfare

Whereas a hospital has its own problems re-intern welfare and whereas study of such problems is an integral part of the C.A.M.S.I. program. Therefore be it resolved that (1) the C.A.M.S.I. committee in each school encourage the interns of the hospitals in each region to form intern committees to study intern welfare under headings suggested by the intern Questionnaire; (2) That these committees collaborate with local C.A.M.S.I. committees and with other hospital committees in this study and to report by delegate to the National Conference of C.A.M.S.I. (3) That the said committees be organized prior to the commencement of internships with the assistance of the C.I.B. wherever possible.

5. Student Health

Whereas the maintenance of the health of the students is a matter of great importance. Be it resolved that the National Committee on student health report on the various forms of student health in operation and in their opinion suggest the minimum requirements for adequate student health services.

(2) That the various local Committees with the aid of the National Committee strive to see that the students in their medical schools receive the minimum of health service.

(3) That an adequate standardized system of records be established.

(4) That an organized system of student health service be instituted in such schools as do not enjoy such a system.

6. Medical Scholarships

Whereas the C.A.M.S.I. is committed to a program of student aid;

And whereas the costs of medical education are at present very heavy. Be it resolved (1) That C.A.M.S.I. put itself on record as desiring to foster the awarding of scholarships to medical students and that C.A.M.S.I. encourage the provincial governments in granting of scholarships to medical students wherever possible taking advantage of the provisions of the Dominion Provincial Youth Rehabilitation Act.

7. Publications

Whereas it is in the best interests of the National C.A.M.S.I. to have a permanent National agency.

Whereas it seems financially practicable that such be formed, pending further investigation.

Therefore be it resolved (1) That a National Committee consisting of representatives from McGill and Laval be appointed to study this question. (2) That a report on plans for such a National Organ be presented to the National Executive by McGill and Laval.

8. Moving Pictures

Whereas many medical schools are interested in education by moving pictures. Therefore be it resolved that the National C.A.M.S.I. committee supply sources of, and critical valuation of such motion pictures.

9. Re Canadian Intern Board

Whereas the Canadian Intern Board has been formed and operated for the past year to the complete satisfaction of all parties concerned, be it resolved that

1. The constitution of the Canadian Intern Board be adopted as read and filed with the national executive.
2. The C.I.B. shall continue to operate far the next year as outlined.
3. The financial report of the C.I.B. be accepted as submitted by Dr. F. Logan.
4. The application fee be maintained at $1.00 for the ensuing year.
5. The constitution and report of the C.I.B. be sent to A.M.S. officials as an aid in solving their existing problem re intern appointments.
6. Mr. Clifford Healy be secretary to the C.I.B. for the next fiscal year.
7. In view of the untiring efforts of Mr. William Kerr in devoting considerable time to the capable handling of the secretarial tasks connected with operation of the C.I.B, this committee move him a vote of thanks and an honorarium of $25.00.

10. Re Maintenance Allowance

Inasmuch as it is apparent to all parties concerned that the post-graduate training of certain students might be jeopardized by the present lack of honoraria in association with many otherwise desirable Canadian hospital appointments, be it resolved that

1. The C.A.M.S.I. concern itself with this problem and emphasize to parties concerned that the issue is simply one of obtaining a minimum "maintenance allowance", as distinct from intern pay in order that graduates may obtain an independent existence from their training.

2. That in considering the approach to the solution of this problem the C.A.M.S.I. declare itself in complete accord with the recommendations of the joint committees of the C.M.A. and Ont. M.A., on intern welfare and education as regards honoraria as recorded in their formal report to the C.M.A. (see Sec. 25, page 27 of "Intern Education and Supervision").

C.A.M.S.I. OFFICERS FOR 1940-41

NATIONAL EXECUTIVE 1940-41, McGILL UNIVERSITY, MONTREAL

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President . . . . . DONALD LLOYD-SMITH
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E. S. Ryerson, M.D., C.M., Assistant Dean and Secretary of the Faculty of Medicine, Assistant Professor of Surgery.

REPORT OF A SURVEY ON THE INCIDENCE OF PULMONARY TUBERCULOSIS AMONG MEDICAL STUDENTS IN THE UNIVERSITY OF TORONTO

By Wm. Caven, '40

During the academic year 1938-9 a complete survey was made to determine the incidence of tuberculosis among medical students in the University of Toronto. This survey was part of the medical student health programme sponsored by the local C.A.M.S.I., and was the first survey of this kind attempted in Toronto. Tuberculosis has long been known to be a very vital problem in the health of medical students and recent graduates, and there is very definite evidence to prove the need of such a careful check on student health.

The plan adopted for the survey was first to do an intracutaneous skin test on all medical students in the faculty. The skin testing was all done in the Department of Hygiene and Preventive Medicine. All students were given an intracutaneous injection of 1/20 mgm. of old tuberculin, and those negative to this dilution were given a further injection of 1 mgm. The positive reactors to 1 mgm. or less were then notified and for a nominal sum had an X-ray taken in the Department of Radiology. These plates were read by members of the Radiology staff and any students showing radiological signs of tuberculosis were referred to certain members of the medical staff for physical examination to determine clinical activity.

This survey was in no way compulsory but the students were strongly advised to take advantage of the opportunity offered. The response from the junior years was excellent but decreased as one proceeded through the higher years, where, as will be shown, such testing was most needed.

Results of the Tuberculin Testing

Of the 798 students in the faculty 753 received intracutaneous injections of 1 mgm. of old tuberculin or less. The following table shows the results of the testing:

Year	Total no. tested	Positive to 1/20 mgm.	Positive to 1 mgm.	Total positive to 1 mgm. or less	% positive to 1 mgm. or less
First year	142	33	45	78	54.2
Second year	104	46	28	74	71.1
Third year	118	36	42	78	64.4
Third year B&M	9	4	5	9	—
Fourth year B&M	9	8	1	9	—
Clinical Years					
Fourth year	112	83	17	100	81.9
Fifth year	130	77	40	117	90.0
Sixth year	131	88	17	105	80.2

On examining these figures we see that the percentage of positives is high throughout all the years, and that there is an abrupt rise in the number of positives in the clinical years. Numerous earlier reports from surveys of this nature made in United States indicate a higher percentage of positive reactions among medical students than among the general college

population of the same age group. These writers emphasize the manner of living and overwork as being the cause. Now they recognize exposure to clinical cases of tuberculosis as the cause. This fact is well brought out here. The first three years being academic the number of positive reactors are similar to those found in general college surveys. In the clinical years we see an abrupt and increasing rise in the number of positive reactors, and it is in these years that the student is exposed to open cases of tuberculosis.

In comparing these results with those obtained from surveys of this nature made in American colleges it is found that the average number of positives, even in the pre-clinical years, is higher than in a general college survey. Long and Seibert, in 1935-6, in a summary of results in tuberculin testing among college students, from twenty colleges in the United States, report on 18, 744 students. For New England and the Atlantic coast the positives ranged from 46% to 48.9%, Middle West 20-30%. The figures for Northern California and Oregon were similar to those on the East Coast. In Southern California they ranged from 54-60%. These figures are all lower than the figures found in the comparable academic group in this survey which ranged from 54.2-71.1%.

The results in the clinical years here correspond closely to results found among American medical students. Harvard and other centres report approximately 85% positive reactors among final year students, whereas only 60% were positive in the first year.

Radiological Reports

Of the 570 students showing positive reaction to 1 mgm. or less or old tuberculin, 428 had x-rays taken. The following were the results:

Year	Positive reactors	No. x-rayed	Reported as suspects
First year	78	65	1
Second year	74	64	0
Third year	78	77	0
	Clinical Years		
Fourth year	100	80	5
Fifth year	117	87	2
Sixth year	105	52	4

There were twelve chest plates reported as showing some radiological evidence of tuberculosis. Of these twelve plates eleven were of students in the clinical years, which bears out the point that there is a definite co-relation between incidence and exposure. It is difficult to draw any definite conclusions from these results because of the poor response on the part of the students in the clinical years. It is very significant, however, that twelve suspect cases were found in 428 students examined radiologically.

Clinical Report

The twelve students showing some radiological evidence of tuberculosis were examined by staff doctors and all were allowed to continue their studies for the year. This year all the undergraduates of this group are back in the course, none having lost any time from school. The four graduates reported last year as suspects are now all interning. From the group of twelve students reported as suspects radiologically none were found to have sufficient evidence of pulmonary tuberculosis to warrant sanitoria or other treatment.

While this survey was in progress two students were absent because of tuberculosis. One student had definite evidence of tuberculosis and the other was under observation. These two cases did not come in the general survey. At the time of writing both these students have returned to school and are carrying on in the course. Since the survey was completed one student who was reported negative last year has had to remain out of the course because of some evidence of pulmonary tuberculosis. There may have been others who are not included in this survey, because they knew they were suspect cases and were being followed elsewhere. We have, however, no record of any such case.

Plan of Testing This Year

Following the general survey of last year new students entering the faculty have been skin tested and positives are to have x-rays taken. Besides this complete survey in the first year all negative reactors in the survey of last year have been re-tested with the same dosages of old tuberculin, and positives x-rayed. By this method it is hoped to catch any new cases as they develop, and to catch such cases early enough that adequate treatment may be instituted immediately.

As in the survey of last year, the co-operation from the general student body has only been fair. First year responded well, then the response began to lag until, in the higher clinical years, very few students came to be tested.

In the students entering the faculty approximately 50% showed a positive reaction, which is comparable to the results obtained in the first year last year. In the second year approximately 20% of those who were negative in the first year in last year's survey became positive. Similarly in moving up from second year to third year 20% of the negatives became positive. In the step from the academic to the clinical years we again see the effect of exposure, in that, 33% of the negatives became positive on moving up from third to fourth year, and 25% of the negatives of the fourth year became positive in the fifth year. Sixth year did not turn out in sufficient numbers to quote figures on the change in this group.

The x-ray reports are not available as yet, and the above figures on the tuberculin testing are just approximations. These figures point out the high incidence of positive reaction as in the general survey, and also show the effect of exposure to clinical cases in the clinical years.

Summary

It is beyond the scope of this report to go into all phases of the testing, adequacy of the methods used compared with other methods employed in similar surveys. The results of this survey, however, show the necessity for careful and regular examinations of this sort, and we have outlined the follow-up survey that has been used in this faculty. The persons who will have to watch are those who were negative in the academic years and then became positive in the clinical years. These students are particularly liable to develop tuberculosis.

From the survey the following points are noted:

(1) The higher incidence of positive reactions to old tuberculin occurring among medical students.

(2) The definite co-relation between exposure to cause of tuberculosis and the increase in the incidence of positive reaction.

(3) The need for such testing to check on student health and to obtain early diagnosis of pulmonary tuberculosis and institute proper treatment. We are all to well aware of the high incidence among medical students and recent graduates.

REPORT OF THE NATIONAL COMMITTEE ON INTERN WELFARE

When the national committee on Intern Welfare was formed at McGill it was faced by a problem about which much had been said, but which still remained vague and indefinite. The committee was composed of undergraduates and felt itself rather remotely placed from the facts of internships. As you know, the C.M.A. publishes a list of approved and recommended hospitals, but the prospective intern knows comparatively little about the actual conditions of internships, and whether they suit his needs.

We thought that the best way to explore this field was to send a questionnaire to all 1938 graduates of schools affiliated to the C.A.M.S.I. This would afford a fair cross-section of intern conditions across Canada. Accordingly, we draw up a questionnaire based on that used by the I.C.A. and upon the report on "Intern Education and Supervision", prepared jointly by the Ontario Medical Association, the Canadian Medical Association.

We wrote to the universities of Manitoba, Western, Toronto, and Queens, asking for a list of their graduates, and a letter of introduction from their local undergraduate societies, to be included with the questionnaire. To cover the costs of mailing and supplies we asked for eight cents per name. The University of Manitoba immediately co-operated. Toronto could not give us the money because of the late date of our request.

The number of answers received was surprisingly high in view of the length of the questionnaire, and the usual fate which such enquiries meet. A little less than half the McGill graduates, and a little over half the Manitoba graduates responded.

These results were tabulated, and a copy was sent to Dr. Agnew (who co-operated with the Toronto committee in forming the Intern Board), a second to Manitoba, and a copy was placed in the Associate Dean's office, at McGill, available to all medical students.

The questionnaire was of value in that it showed the great divergencies in internships. What was most encouraging was the enthusiasm with which many of the interns answered, writing extensive comments, approving of the Association, and the questionnaire.

As to the results themselves, we must admit that they are not as informative as they could have been with more skillful wording and planning of the questionnaire. Only a small number of hospitals was covered. Because of the large personal factor which enters, as when divergent opinions are received regarding the same hospital, we prefer not to draw too many conclusions. However, conclusions may be drawn when a whole group feels that too much laboratory work is required, too many patients are assigned each intern for careful work, training in a certain service is not sufficient, the library is inadequate, etc. Of course, the results depend on the type of internship held, and what services are included. Also, if the hospital has an inadequate library it may be that the interns have access to an excellent medical school library.

We would like to see eventually some source from which interns and students could get complete information concerning the internships and residencies available in Canada. We would also like to see adequate internships throughout Canada; there are many fine internships offered, but there is room for improvement. Perhaps few fulfill the standards suggested by the joint committee of the O.M.A. and the C.M.A., even if the question of a maintenance allowance of $25.00 a month, which it recommends, be excluded.

The hospitals also have their problems, and in many cases probably do their best to provide suitable internships under existing circumstances. It is often said that there are insufficient interns available for the work to be done, but overworking interns leads to disastrous results. The more valuable the internships are, the longer will interns be willing to spend in hospitals, and thus the number of available men should be correspondingly increased. Often a wiser division of work could probably be arranged, making for more efficient services, and more scope for the intern's activities. We might suggest that the employment of technicians and secretaries would reduce much of the routine work, and leave the intern free to do work more essential to the hospital, and more instructive to himself.

Regarding the matter of interns' health, some hospitals do make provisions for periodical examinations, and some even insist on it, thus catching disease in the latent stage. This obviously benefits the hospital as well as the intern.

Hospitals do not exist primarily to train interns, but to take care of the sick. But this depends on the quality of the interns' work, which in turn depends upon the training afforded him, and the time he can devote to each case.

Nowadays, internships are considered an essential part of medical education, and the intern must make sure he does get that education. This education should be definitely planned for and organized up to the same standard as the rest of the medical course. We are not advocating a standardization of internships, but a raising of standards. In such a program interns form an essential part. They stand to profit or lose, and they have the required information and experience. In Montreal we are in touch with a group of very interested interns.

We would recommend that an effort be made during the coming year to interest as many interns as possible in such aims. This might be best accomplished by dividing the country into regions corresponding to the location of each medical school. The medical school, working through its graduates, should try to show the interns that the C.A.M.S.I. is their organization too. Then a truly accurate summary of internship conditions with their suggested improvements may be made. Regional committees in each centre, and a national committee to co-ordinate their activities should be formed, and some means of registering the affiliated intern groups should be set up.

L'ASSOCIATION CANADIENNE DES ETUDIANTS EN MEDECINE ET DES INTERNES

INTRODUCTION

Les 2 et 3 mars avait lieu à Kingston le troisième Congrès annuel de A.C.E.M.I. L'Université de Toronto avait reçu les délégués lors des deux dernières conventions et nous devons remercier les étudiants de Toronto pour leurs infatigables efforts dans la formation de notre organisation. En plus de ces trois congrès annuels, une convention semi-officielle eut lieu l'automne dernier à Québec, où se sont réunis plusieurs délégués.

Notre association est jeune et de ce fait peu connue. Plusieurs d'entre vous peut-êtret vont être étonnés d'apprendre l'existence de A.C.E.M.I. Cependant, nous avons déjà accompli plusieurs choses entre autres: la formation d'un Comité Canadien des Internes, une de nos plus belles réussites. Ce Comité fondé l'année dernière a fonctionné avec tellement de facilité et de perfection que même ses fondateurs en ont été surpris. L'activité inlassable de W. K. Kerr pour en assurer le succes mérite toute notre reconnaissance.

Déjà des progrès ont été réalisés dans le domaine de la santé des étudiants, surtout au point de vue de la tuberculose. Toutes les écoles de médecine font subir aux étudiants un test à la tuberculine et un examen radiographique. Et comme résultat de ces enquêtes, on a pu compiler des statistiques très intéressantes. Ceci ne constitue qu'une partie des acticités que nous avons mises en marche.

A cette dernière convention, des Comités ont été formés qui devront enquêter et faire rapport à notre prochaine réunion sur des sujets tels que: une meilleure entente avec le Conseil des Examens du Dominion et des taux plus raisonnables—l'étude d'un projet de rétribution aux internes seniors—la valeur des vues animées dans l'enseignement—la possibilité d'obtenir des bourses d'études—la formation d'un organisme national pour la diffusion des activités des étudiants à travers le Canada.

Ces activités sont tout à l'avantage de l'étudiant et de l'interne et nous souhaitons l'adhésion complète de tous les étudiants afin d'obtenir les meilleurs résultats possibles. Il est de toute première importance que les finissants se tiennent en contact avec nous et nous mettent au courant des déficiences qu'ils pourraient recontrer dans les différents hôpitaux où ils se trouvent. A.C.E.M.I. est en effet une association d'étudiants et d'internes et ceux-ci tireront profit de l'appui qu'ils nous apporteront.

Nous, qui avons pris part à l'organisation de A.C.E.M.I., nous sommes heureux de ses réalisations; ses progrès sont satisfaisants, et comme le faisait remarquer l'un d'entre nous, si nous continuons d'obtenir de tels résultats, la condition de vie de l'étudi ant et de l'interne canadien sera idéale.

RESUME DES RAPPORTS PRESENTES

1) *Organisation.*

Ce fut à Toronto le 13 mars 1938 que prit naissance l'Association Canadienne des étudiants en Médecine et des internes.

Réunis en congrès dans ce but, les fondateurs, étudiants en Médecine et internes représentaient les Universités McGill, Queen, Toronto et Western.

On dressa un sommaire des fonctions, du but et de l'organisation de l'A.C.E.M.I. On établit ensuite un Exécutif National à Toronto.

Depuis ce temps, la liaison a été établie entre pratiquement toutes les facultés de Médecine canadiennes.

Au contrès de 1940, tenu à Kingston, les 2 et 3 mars, toutes les facultés de Médecine étaient représentées. Pour les détails au sujet de l'organisation, reportez-vous s'il vous plaît à la constitution de l'A.C.E.M.I. Les activités de l'organisation furent présentées comme questions à part: telles que la question de la tuberculose, de la Canadian Intern Board.

2) *Cooperative d'achat de volumes et d'instruments* (rapport présenté par l'Université de Western.)

Vu les prix exorbitants que les étudiants de plusieurs facultés de Médecine sont obligés de payer pour leurs volumes et leurs instruments, l'Université de Western a dressé un plan d'achat, recommandable par son exécution pratique, et financièrement très sùr; les résultats se révéleront par des économies s'étendant sur une période de six ans.

"L'Association des Disciples d'Hippocrate" a combiné une librairie et un "tuck-shop" administrées par quelques étudiants auxquels l'Association paye un salaire. La vente de différents accessoires produit l'argent nécessaire à l'administration de la librairie. De cette façon les étudiants peuvent se procurer leurs volumes à prix réduits.

Quoique les étudiants achètent leurs volumes à prix réduits, des dividendes leur sont payés à la fin de l'année scolaire, dividendes s'élevant à 10% sur les volumes et à 20% sur les instruments.

Le principe de la coopérative, basé sur l'achat par les étudiants est sùr, et riche en conséquences extra-universitaires, car c'est une façon de faire pratiquer l'économie.

3) *Publications*

Notre organisation cherche encore à établir de façon permanente un moyen de publication de ses activités et de ses buts. Mais tout journal ou médium à cet effet ne devra pas dépasser les capacités financières de l'Association. Pendant que les Universités McGill et Laval travaillent à ce projet, l'Université de Toronto a généreusement offert son journal pour la publication des activités de l'Année. Mais ce serait imposer à une seule Université un fardeau financier trop lourd. Aussi, avons-nous décidé que les fascicules seraient distribués avant et après le congrès et leur coùt défrayé par les étudiants au moyen d'annonces.

Nos confrères de McGill et Laval travaillent actuellement à la création d'un journal qui serait.

a) de nature strictement médicale, renfermant soit des articles présentés par les étudiants à leurs universités respectives, soit des rapports rédigés spécialement pour le journal.
b) semblable àu journal de l'A.M.S. composé d'articles d'intérêt général ou ayant trait à la médecine.
c) ou qui porterait sur les seuls rapports des activités de l'A.C.E.M.I.

4) *Sante des etudiants*

a) Le problème exige une attention particulière car il varie selon les facultés et les provinces.

c) *Tuberculose*

Des relevés sur la fréquence de la tuberculose parmi les étudiants en médecine ont été faits par McGill et Toronto, entreprise prônée et encouragée par l'A.C.E.M.I.

A Toronto sur 798 étudiants composant la Faculté de Médecine, 783 furent examinés. Les examens et les radiographies ont démontré une augmentation brusque du nombre des cas positifs pendant les années de clinique.

Douze étudiants ont montré des signes évidents de tuberculose, signes diagnostiqués par une radiographie sévère; cependant les cas ne demandent pas une entrée immédiate au sanatorium. Le rapport ne peut pas s'étendre aux méthodes, moyens et instruments utilisés.

A noter dans ce rapport, les points suivants:

1) L'augmentation parmi les étudiants en médecine des réactions positives à la tuberculose.

2) Une corrélation évidente entre l'augmentation des cas positifs et le contact avec les malades tuberculeux.

3) La nécessité de tels examens pour contrôler la santé des étudiants, pour dépister la tuberculose pulmonaire, enfin pour indiquer un traitement rationnel.

On a constaté malheureusement une augmentation pénible de cas positifs parmi les étudiants en médecine et les internes.

5) *L'Entretien des Internes*

Le problème est d'un intérêt vital pour chaque interne, mais très délicat à résoudre. Dans l'est, la plupart des internes ayant déjà fait une année d'internat junior reçoivent quand ils sont diplomés un salaire raisonnable. Les Facultés des Universités Montréal et

Laval n'ont point à se plaindre. McGill possède un système différent car l'année d'internat est pour eux une année scolaire. Donc il n'est point question de salaire.

Mais en Ontario, la situation est déplorable. En effet, que l'interne manque de fonds pour son entretien personnel semble absurde. Aussi il se fait un travail intense pour améliorer cet état de choses.

RESOLUTIONS

I. *Services de Santé nationale*

Attendu qu'il est du meilleur intérêt des étudiants en médécine qu'ils soient bien au courant des conditions dans lesquelles ils pratiquent, et attendu que la division des services médicaux et de la santé publique du Comité national pour l'Hygiène mentale a récemment présenté une étude détaillée des conditions de la santé au pays, où fut démontré l'insuffisance des services médicaux à satisfaire les besoins de tout le Canada;

Par conséquent, qu'il soit résolu que l'A.C.EM.I. coopère avec les autres organisations, comme l'Association Canadienne de la Santé Publique, le Comité de l'Hygiène Mentale, et l'Association Médicale du Canada, etc.;

Que les comité locaux de l'A.C.E.M.I. organisent des groupes d'études et des séries de conférences pour familiariser leurs membres avec les tendances nouvelles dans ce domaine;

Que l'Exécutif National encourage les groupes locaux dans de telles activités.

II. *Honoraires du Conseil du Dominion.*

Attendu que les honoraires actuels pour l'examen du Conseil du Dominion semblent plus élevés qu'il est nécessaire pour subvenir aux dépenses de ce Conseil;

Et attendu que les dépenses des étudiants gradués ont continuellement augmentées dans un grand nombre d'Universités;

Qu'il soit résolu que le Comité National de l'A.C.E.M.I. à sa convention à l'Université Queen's, le 3 mars, 1940, prie le Conseil du Dominion de diminuer les honoraires de l'examen, dans la mesure du possible.

III. *Examens du Conseil du Dominion.*

Attendu que les examens du:Conseil du Dominion semblent répéter dans une plus grande mesure les examens de fin d'année des différentes Facultés de Médicine de par le Canada;

Qu'il soit résolu que le Comité National prie le Conseil du Dominion de considérer la possibilité de collaborer avec les Facultés de Médicine et de faire ensemble une seule série d'examens qui satisferont le Conseil du Dominion et les Facultés de Médicine.

IV. *Bien-être des Internes.*

Attendu que chaque hôpital considère la question du bien-être des internes sous un angle qui lui est propre;

Attendu l'étude d'une telle question fait partie intégrale du programme de l'A.C.E.M.I.;

Qu'il soit résolu que les comités locaux de la CAMSI encouragent les internes de chaque hôpital à se réunir en sous-comités pour étudier la question en se basant sur le questionnaire concernant les internes (questionnaire envoyé à chaque Université en 1939).

Que ces comités collaborent avec les comités locaux de l'A.C.E.M.I. et aussi avec les autres sous-comités des hôpitaux; et qu'un rapport sur cette question soit confier au délégué officiel à la Conférence nationale de l'A.C.E.M.I.;

Que les dits comités soient formés avant que les internes fassent leur internat, avec si possible l'aide de la C.I.B.

V. *La Santé des Etudiants.*

Attendu que la conservation de la Santé des étudiants constitue un problème de la plus haute importance;

Qu'il soit résolu que le rapport du Comité national sur la question de la Santé des étudiants porte sur tous les modes d'agir actuels quant à la conservation de la santé estudiantine, et qu'il indique les conditions nécessaires pour l'établissement des services médicaux.

Qu'il soit résolu que les comités locaux s'efforcent, avec l'aide du Comité National, de voir à ce que les étudiants recoivent le minimum de services médicaux.

Qu'il soit résolu qu'un système adéquat et stérootypé soit établi pour la tenue de fiches personelles.

Qu'il soit résolu qu'un système de services médicaux soit établi dans les Universités où un tel système n'existe pas.

VI. *Bourses d'Etudes pour les Etudiants en Médecine.*

Attendu qu'un point important du programme de l'A.C.E.M.I. porte sur l'aide aux étudiants;

Attendu que les frais d'une éducation médicale sont actuellement très élevés;

Qu'il soit résolu:

1) Que la CAMSI fasse rapport sur le désir qu'elle a que des bourses d'études soient accordées aux étudiants en médicine;

2) Que la CAMSI encourage les gouvernements provinciaux dans la distribution des dites bourses; les dits gouvernements s'appuyant sur les disponsibilités monétaires offertes par l'organisme de l'Aide à la Jeunesse.

VII. *Publications.*

Attendu qu'il y va de l'intérêt de l'A.C.E.M.I. de posséder un médium (journal, ou publication quelconque);

Attendu qu'un tel organe pourrait être créer sans danger financier;

Qu'il soit résolu qu'un Comité composé de représentants de Laval et de McGill, soit formé dans le but d'élucider ce problème;

Qu'un plan pratique quant à l'émission d'un organe (journal ou publication quelconque) soit soumis à l'Executif National par ce Comité.

VIII. *Films éducationnels.*

Attendu que plusieurs Facultés de médicine s'intéressent à la valeur éducationnelle des films médicaux;

Qu'il soit donc résolu que l'A.C.E.M.I. s'informe de la valeur des dits films et qu'il se renseigne des endroits d'approvisionnement des dits films.

UNIVERSITE DE MONTREAL

1) *Examen médical*

Les étudiants de l'année prémédicale subissent au début de septembre un examen médical complet par le médécin officiel de l'Université.

Cette année, grace à l'A.C.E.M.I. et à la Conférence Laennec, un comité a été formé composé d'étudiants de 2e, 3e et 4e années. Ce comité fait un examen complet des élèves de l'année prémédicale. Il travaille sous la surveillance des médecins de la Faculté de Médecine et l'Institut Bruchési, institution spécialisée dans la lutte arti-cuberculeuse.

Des radiographies pulmonaires sont prises sans charge pour l'étudiant.

Un dossier complet et détaillé sur l'état de santé de chaque étudiant est conservé en filière.

2) *Lutte anti-tuberculose*

En vu de dépister la tuberculose parmi les étudiants en médecine, nous avons réussi à obtenir gratuitement pour les élèves de l'annéé prémédicale et pour les internes (5e année.)

1—test à la tuberculine.
2—radiographie pulmonaire.
3—examen pulmonaire par des spécialistes de l'Institut Bruchési.
4—B.C.G. (gracieuseté du Dr. Frappier, chef du laboratoire de bactériologie de l'Université de Montréal—pour les étudiants qui le demandent.
5—Les cas positifs sont placés sous la surveillance des spécialistes de l'Institut Bruchési.
6—Un dossier complet est rempliet conservé pour chaque étudiant.
7—Tout ceci est gratuit et sous aucune charge pour l'étudiant.

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